# The Veterinary Record

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 40. OCTOBER 6, 1934. VOL. XIV.

## General Article

## MILK HYGIENE*

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I wish to thank the Council of the Irish Veterinary Medical Association for giving me the honour of presenting this paper. The primary purpose of my paper is to put before those members of the profession who have not studied this matter, the general principles and some of the more important details concerning the handling of milk. This subject is primarily one for our profession—no one is more qualified to deal with it than the veterinary surgeon, but unfortunately as a body we have not applied our efforts in this direction, with the result that others, less qualified, and in many cases unqualified, have set themselves up as experts and have acquired a power to which they are not entitled. This is entirely due to our own inactivity, and I further maintain that it is almost equivalent to criminal negligence that we have not taken stronger action in a matter which is pre-eminently ours, and which is so vital to the health of the people from whom we derive our livelihood.

It is also my opinion that it is our inactivity which has delayed the on-coming of clean milk production. After all, our lives are devoted to the study of animals in health and disease. The sole use of the cow in these countries is for her milk and meat. We have studied her; we know her normal activities and products; we know the abnormal ones, therefore it is our duty to determine the methods of handling meat and milk so as to provide what is healthy and eliminate what is unhealthy.

I now propose to put before you, as clearly as I can, information which every veterinary surgeon should possess, so that he may be in a position to instruct a dairyman who seeks his advice on this matter, and particularly so that he may use his influence to propagate this gospel of clean milk among milk producers with whom he is in continual contact. And let me disillusion some of you at once; clean milk is not a matter of palatial houses and expensive machinery. Far from it. We get the best results here from a dairyman with the cheapest and simplest equipment, but he knows his job; his cows are clean, his hands are clean and his pails and utensils are clean. Therefore the milk is clean.

Before discussing clean milk methods we must have a slight idea as to the nature of milk itself. Normal milk in an average healthy cow contains about 3·5 per cent. of butter fat and 8·5 per cent. of non-fatty solids in a watery solution and its reaction is slightly acid. The legal minimum standard is 3 per cent. of butter fat and 8·5 of non-fatty solids. The non-fatty elements consist of proteins, milk sugar, a multiplicity of mineral salts, the vitamins and certain enzymes. The principal protein is caseinogen which, when acted upon by pepsin in the presence of calcium salts, or by an acid, is coagulated. Milk sugar under the influence of certain bacteria, notably those of the lactic acid group of organisms, is converted into lactic acid which, in turn, will coagulate the caseinogen. The fat may be altered by certain enzymes (lipase) present in the milk and by the action of certain bacteria which bring about the formation of fatty acids, among which is butyric acid, the acid mainly responsible for the rancidity of butter.

Nature intended that this milk should be fed directly from the cow's teat to the calf and a few experiments have proved this to be the best method, but man has found many other ways of utilising milk for his own purposes. In this paper I must confine my attention to raw liquid milk as milked from the cow by hand or with a milking machine.

The fundamental principle in milk hygiene is that milk produced by the milk cells of a normal udder is a sterile product. In that form it is intended to be used, therefore it is the duty of the dairyman first to provide cows with healthy udders and then to milk them and deliver their milk in a manner which will prevent external contamination. It is on this principle that all our methods of milk hygiene must be based, just as the principles of aseptic surgery are based on the fact that the tissues and body cavities of the normal animal are aseptic. Let me assure you that it is only by grasping this principle and aiming at it that healthy clean milk can be produced. Our present system of handling milk is so open to unavoidable contamination that it is only by aiming at the ideal that the minimum can be ensured.

For centuries the world laboured under the delusion that dirt means something which one can see with the naked eye, such as cow dung, hair, hay, dust, etc.—remove these with a

* Paper presented to the Annual Provincial General Meeting of the Veterinary Medical Association of Ireland, Limerick, July 28th, 1934.

strainer and all is well. That is not so. The fact is that visible dirt is simply undigested wood fibre and harmless hay, hair or dust, but it is because this visible dirt carries bacteria of all kinds, which it introduces into the milk, that it is harmful. And there is very little to be gained by removing it from the milk because most of the bacteria have almost immediately been washed into the milk. Therefore the absence of visible dirt from milk presented for sale is no indication of its bacterial purity. If visible dirt is to be taken as a standard of purity then the problem of clean milk is easily solved for the producer. A good strainer can be procured for a few shillings or a cloth for less. The strainer does not hold back the bacteria. In fact, as the milk goes through the strainer it washes more bacteria out of the dirt which is held back from the previous lot of milk. The only use one might make of a visible dirt test is to determine the efficiency of an individual milker before the milk is strained. In the course of a great number of bacteriological examinations I have very often found a far greater number of bacteria in milk which was free from visible dirt than in milk which was distinctly dirty. I have also washed out a straining pad, which had held up quite an amount of visible dirt, after 30 or 40 gallons of milk had passed through it and I was not astonished to find that the washings did not contain a huge number of bacteria. I want to impress upon you that there is only one method of determining the purity of milk and that is by determining the number and type of bacteria in it.

I will now proceed to point out to you the sources from which milk may be contaminated in its passage from the cow to the table, and having discussed them I will then indicate how they may be dealt with. The cow herself may be dirty. The milker may suffer from transmissible disease, or his hands and clothes may be dirty. The milking machine may be contaminated. The cow-shed may be dusty. The milking utensils may be contaminated with dirt and milk residues. Finally, the milk may remain hot for hours. I add this among contaminations because moderate heat promotes the rapid growth of bacteria. So the milk leaves the farm. It may be delivered from door to door, exposed to the dust of the streets, and then poured into a dirty vessel presented by a housewife, or perhaps delivered to a retailer who leaves it exposed in a dusty shop or even kitchen. Thus nature's most perfect food may go on until, eventually, it may be almost replaced by organisms, and then, worst of all, perhaps be fed to a delicate child with the disastrous results which are only too common.

Let us consider these sources of contamination in detail. One has to begin with a healthy cow. Among the diseases met with in these countries, mastitis, tuberculous and otherwise, is the most important. Tuberculosis of the udder is characterised by a chronic induration, not associated with heat, pain or fever. The milk is unchanged at first, but as the disease progresses it becomes watery and flocculent. In most cases, but not always, it is associated with other clinical features, for example, a chronic cough, emaciation, sterility, etc. The causal organism is excreted in the milk almost continuously. A tuberculous udder may show no clinical alterations. Even in *post-mortem* examinations one often finds the lymph gland affected without detecting any evidence of tuberculosis in the udder itself. The organism may be intermittently excreted from a healthy udder, the focus of infection being elsewhere. The disease may be diagnosed clinically or after a laboratory examination, where the organism may be discovered with the microscope or after a guinea-pig test. (I must add here that I am only touching on the bovine diseases which I shall mention.) Mastitis—septic, acute, chronic or gangrenous—is numerically more important. In the acute form, the first observable change is in the milk. It becomes slightly flocculent; this is detected by careful examination of the milk, especially the first few teatsful of milk taken at milking time. The best piece of apparatus to use for this examination is one made by the Alpha Laval Company, and consists of a mug on which fits a black saucer perforated at the side. This mug is intended to collect the milk, and the milker who performs this operation must observe each teatful of milk as it fal's on the saucer, when the black surface will readily show up any floccules. As the disease progresses there is swelling of the quarter, heat, pain, pus cells invade the milk, etc. In cases of mild or chronic mastitis, diagnosis is more difficult and often the disease may only be detected by laboratory methods. A simple and useful aid is Brom Cresol purple paper, which when placed in normal milk turns a dove grey, but in cases of mastitis becomes blue in less severe cases and purple in those more definite. Similar colour changes may take place in cows which are drying off.

Various forms of cow-pox are important. Typical variola is mostly confined to first calf heifers and affects the skin of the teat and udder as well as the inner lining of the teats and perhaps also the milk cistern. This condition is transmissible to human beings. Secondary organisms invade the sores and scabs, all of which contaminate milk. There are other forms of pox attributable to other causes; one particular form has been responsib'e for serious epidemics of septic sore throat, and an infected milker may actually transmit the disease to the cow. Blood-stained milk may be due to injury, rupture of blood vessels, ulceration of the milk cistern, mastitis, and rarely, to some forms of poisoning. Wounds and abscesses of all kinds

must be taken into consideration, also the possibility of actinomycosis and actinobacillosis. *B. abortus* Bang frequently resides in the udder and its associated lymph glands and is excreted with the milk. Such milk is receiving increasing attention from health authorities, owing to the number of cases of undulant fever in human beings which are alleged to have been traced to this source. I discussed this matter with a well-known authority recently. He told me that in his opinion the number of bacteria excreted by the udder would not be sufficient to set up the disease and that the infected milk taken by such people must have been contaminated by uterine discharges. The above include the most important of the diseases of the udder, but many other systemic and local diseases may contaminate milk.

The principal one of these is tuberculosis. One might write volumes on the subject, but I must confine myself to discussing the manner in which milk may be contaminated. We have discussed contamination of the udder. When the lung substance is affected the tubercle bacilli may be coughed out on the manger or field, but some or all may lodge in the throat and be swallowed and later passed out in the dung. Here we have found that over 40 per cent. of affected bovines of all ages were affected in the lung substance. The late Dr. Stenhouse Williams, of Reading, discovered tubercle bacilli in the fæces of 35 out of 185 apparently healthy cows. The possibility of milk being infected by dung or sputum directly or in the form of dust must be very great. A farmer friend of mine had periodic samples of milk taken to test for tuberculosis. On one occasion he took the sample as usual, but allowed it to be exposed to the dust of the cowshed for a few hours. This sample was declared tuberculous. He was immediately visited by the local Medical and Veterinary Officers, who found no clinical evidence of tuberculosis in the herd. He then told them what he had done. Another sample was taken which was negative. The organism may be excreted by the liver into the intestinal tract. Uterine discharges, especially during œstrum, and urine must be taken into account. We found the uterus and kidneys affected in 6·2 per cent. and 6·4 per cent. respectively of affected animals of all ages. Open glands, especially pharyngeals, are dangerous. Of 540 tuberculous animals examined here 45·5 per cent. were actually or potentially open cases.

In cases of retained placenta, metritis or of abortion, contamination is impossible to avoid. Acute enteritis may sometimes be set up by organisms which may cause food poisoning in man. Actinomycotic, tuberculous and other abscesses contaminate the coat and the discharges may be brushed on to the region of the udder. In cases of anthrax the bacilli invade the milk prior to the death of the cow. Milk from cows in any feverish or comatose condition is unwholesome. That of freshly calved or drying off cows should not be used for human consumption. There are many other conditions from which a cow may suffer and which make her milk unsuitable for human food. This particular feature of clean milk production is part of your routine daily work. You are all experts, therefore I need not discuss it further other than to say that in some conditions the cow must be eliminated from the herd, in others she must be isolated and treated. This brings me to forms of contamination other than disease of the cow.

We will first take the dirty cow. The teats, udder, belly, flanks, quarters, thighs and tail must be scrupulously clean, and when I say clean I mean so that no dirt or dust may fall from these parts into the milk pail and also so that the teats and udder will not show any visible dirt when rubbed with a clean towel. This can only be achieved by clipping these parts as closely as possible. The clipping and cleaning of the cow is the absolute *sine qua non* in clean milk production. You cannot get clean milk except from a clean cow, and you will not have a clean cow unless the hair is cut short in the parts referred to. For clipping a number of cows a power clipper is essential. With the aid of a curry-comb, brush, rough towel and a bucket of water these parts are to be cleansed, making sure that the last thing to be used over all is the rough towel so as to damp any dust on the skin. After this a second lot of clean water and a soft towel are used to give the udder and teats a final cleansing. When cows are cleansed twice a day this process should not average more than two minutes per cow. There are a few guiding principles when washing anything: develop a routine method; never wash a dirty on to a clean part; never squeeze a dirty towel into the water, squeeze it in the channel; change the water frequently.

Very closely associated with the cow is the shed in which she lives. A good shed does not necessarily mean clean milk and a bad one dirty milk, but a shed built on the right lines makes clean milk production very much easier. The essential feature of the shed is the raised standing. It must be about 5 ft. from the front of the manger to the gutter, provided that the cow has plenty of head room to lie close up to the manger and that the manger is low enough for her to place her head over it in comfort, that is, that it is not more than eight inches high. If there is not enough head room the standing must be a few inches longer, but one should have the standing as short as possible. Behind the standing is a dung channel at least six inches deep and two feet wide, with a fall away from the cow. If less than two feet wide this channel is easily choked with dung. If at all possible

the cows should be in pairs, so as to obviate their taking up positions across the standing and dunging on it. Leave room at the back for the milkers to pass freely. Needless to mention, the whole floor should be made of impervious material, and the walls should be faced with cement to a height of six or eight feet. If the above points are attended to, the rest will be easily accomplished. After this, I should say that light, natural and artificial, is most important. A milker must be able to see what he is doing. The other features of the shed must be considered according to circumstances, ventilation, drainage, etc. There is, however, insufficient time at my disposal to consider this matter further.

The various operations to be performed in the shed depend on the time of the year. In summer it is used only for milking, and the cleansing of it depends on the manners of the cows. Not everybody realises that cows can be trained not to dung in the shed during milking. I know many instances of it. However, if they misbehave themselves, water and a yard brush must be used freely. I know of a woman who uses a scrubbing brush on her cow-shed daily, and she is not afraid to get down on her knees. In the winter time, when cows spend most of their time in the shed, the following routine should be practised: The sheds must be cleaned out and washed daily; before commencing milking operations, dung near or on the standing must be pushed back, and the same should be done at least in the evening when the cows are resting. On no account is hay to be fed or bedding shaken up soon before milking; the dust set up thereby is detrimental. The whitewash brush should be used freely, not because it is essential for clean milk production, but if the walls, doors, etc., are white, they show up the dirt on the floor, roof, rafters and elsewhere. As I have said, the standing and channel I have described are essential—other features are less important.

Now we have a healthy clean cow in a clean, well-lighted shed; the next to be considered is the milker. He must be free from contagious disease and must not carry the contagions of his associates on his person. Special attention must be paid to tuberculosis, typhoid, typhus, scarlet fever, measles, diphtheria, some forms of sore throat, and so on. Strictly speaking, this is not our job, but as experts in milk hygiene, we must be aware of such things. The unclean milker can contaminate milk in many ways, but in practically all, his hands play a leading part.

He must be provided with a basin, water, soap, a nail brush and a clean towel, all conveniently placed to be used after milking each cow. Dry milking is amongst the most important factors in clean milk production; personally, I would put it on a level with steam sterilisation or cooling. I have studied the results of experiments carried out in Reading and elsewhere, and we have very practical experience of it here. One rarely sees it, but at least the young milkers should be brought up to it, and you should use your influence to instruct them.

After clean hands come clean clothes. Apart from its own merits, a white overall has an extraordinary moral effect. It shows up dirt. The standard garment is slipped on over the head, has short sleeves and is divided half way up in front, so that each half covers the knees and can be held in position below the knees by means of tapes. The milker must be warned over and over again against touching anything dirty once his hands are cleaned, especially the legs of the milking stool, the fetters, the edge of the milk bucket which rests on the ground, dirty parts of the cow and so on. The stool deserves much attention. If possible a metal one with a hole for the hand in the seat should be procured, and it should be washed frequently with soap and water. I would like to see some patent fetters which could be attached with little handling. Impress upon the milker that should he touch something dirty he must wash his hands again. A clean passage must be made for him from the cow-shed to the dairy, so as not to carry dirt into the dairy. It is impossible to deal with a milker who has not the right spirit. To encourage a good man, the producer should be induced to give a bonus on good results.

The faults of the open milk pail are obvious. The openings must be at the side, elliptical, eight or nine by six or seven inches, lying at an angle of from forty-five to fifty degrees to the horizontal. A smaller opening and a less acute angle are more desirable, but they terrify the uninitiated milker. Special pails are made, but as they are expensive we had a special cover made locally to fit on an ordinary pail. Needless to say, the pail is to be used only for milking. A subsidiary to this pail is the Alpha Laval mug mentioned. As the first teatful of milk may be contaminated *via* the teat duct, it must be discarded, not on the ground, but in the manner referred to.

I had occasion to study the tests carried out at a big dairy where a bonus is paid on good bacterial results. One farmer did everything necessary, but his men would not use the special pails. Eventually they did; his test improved at once, and he received another halfpenny per gallon for his milk.

We will now leave the cow-shed for the dairy. This must be convenient to the cow-shed, well constructed, with impervious floor and walls, free from dust, and obviously must, *ipso facto*, be free from contamination. Here the milk is strained, cooled and prepared for delivery. The

first essential is a supply of cold water as near to 50°F. as possible, and the milk must be cooled to within 4° or 5°F. of the original temperature of the water. In a good quality milk maintained at 60°F. the growth of bacteria is almost negligible for the first twelve hours; in fact, the growth of bacteria varies directly with the temperature, and when one realises that a single organism, under ideal conditions, may produce millions of bacteria in twenty-four hours, the importance of this fact is borne out. Good milk maintained at 50°F. will keep for seven days; at 60°F. for three days; and at 70°F. for 36—48 hours. A deep well with a good supply of water is indispensable, and the water must be pumped into a storage tank, if possible placed at the north side of the dairy, away from the sun. The bottom of the tank should be about two feet above the level of the outlet pipe of the cooler. In warm weather water should be allowed to run through the whole cooling system beforehand, so as to take up the heat, and the tank shou'd be filled, immediately before milking, with the required amount of water, allowing four gallons to flow through the cooler for every gallon of milk, if plenty of water is available. A semi-rotary pump at a reasonable price does the pumping admirably, provided the well is not too far away, or that a large amount of water is not required, when an engine may be necessary. In some cases the water may have to be fetched from a distance, or the town supply may be laid on directly to the cooler, if suitable.

The actual cooler is a standard article. It varies in sizes with the rate at which milk is to be cooled in gallons per hour. It may be open or covered. The latter is better but not essential in a dust-free dairy. The inlet is the lower opening, the water flowing upwards through the cooler.

Nearly all modern coolers are easily dismantled and have no crevices, so as to facilitate cleansing. In times of scarcity the surplus water should be collected for washing and so on. In the dairy the cooler is erected on a stand; over it is a five- or six-gallon receiving tank with a tap which opens on to the top perforated plate of the cooler. The receiving tank should be of large capacity so that milk of several cows may mix in it, in case the butter fat test of an individual cow may be below the legal minimum standard. This is particularly necessary when milk is bottled directly from the cooler. From the receiving tank, the milk flows down over the corrugated surface of the cooler and is collected in a pan below, from which it may flow into a churn, or this bottom pan may be part of a bottling device, so that cooling and bottling may go on together. The thermometer should be always in readiness at this juncture.

I prefer the milk to be strained before it goes through the cooler that is over the receiving tank. Most modern strainers are made with a removable wire gauze and a perforated disc to hold the straining material between them. This latter should consist of a cotton wool disc, with a gauze support on one side. These should be placed as follows: the wire gauze is placed on the bottom, then the cotton wool disc, with the woolly side up, then the perforated disc and on top the spring which holds them all in position. The larger the capacity of the strainer the better, as the milk goes through slowly, especially if it is dirty, when the cotton wool may become choked and must be renewed. The milk must be poured in against the side of the strainer, not directly on the cotton wool, which may get torn. The cotton wool is discarded after each milking. The strainer is to me the curse of good milking. It has for so long been looked upon as a purifier that subconsciously the best milkman has a respect for it. As we know milk hygiene, it is the least important apparatus in the dairy, and is intended only to remove accidental hair or dust.

If delivered in bulk the milk is collected in churns immediately under the cooler, or the bottling machine may be placed under the cooler, or, in the case of the small supplier, a churn with a tap from which he fills the bottles afterwards. I might add here that the height at which the cooler is erected depends on the system of collecting milk from it. We have now come to the stage where the milk is collected in churns which are covered and sealed or in bottles which are capped all ready to be delivered in a suitable vehicle to the consumers or retailers.

I now come to a most fruitful source of contamination, namely, the unsterile utensils. The importance of sterilisation will be realised from the following figures published by Dr. Mattick of Reading: Five hundred seventeen-gallon churns, supposed to have been washed and sterilised, were examined by washing them out with one litre of sterile saline. The bacterial content of these churns varied from 170,000 to twenty thousand millions. In the latter case, 240,000 bacteria would be added to each cubic centimetre of the milk poured into the churn. Here we have examined milk vessels in shops, buckets, measures and customers' jugs presented for milk; in some cases we found them to contain millions of bacteria and gross *B. coli* contamination.

Before sterilisation, all utensils must be washed, and this must be done in an ordered manner. All utensils are first dismantled and then rinsed with cold water by pouring the water into or on them. Now they are placed in a tank of tepid water, containing a handful of washing soda to every five or six gallons of water, and here they are quickly cleansed with a brush. After this they are rinsed in plain water so as to wash away the washing soda, and are then placed, mouth downwards, in the sterilising

chest. Bottles are to be washed in the same way. As a rule the utensils require washing soda only once a day.

Sterilising apparatus is no doubt the stumbling-block of most farmers, owing to the expense of providing steam. The standard apparatus consists of a boiler, steam chest, and perhaps a steaming stool. The steam can be provided at high pressure, low pressure or as current steam. The high pressure boiler of 25 lb. per square inch or more is in the long run the best investment. Sufficient steam is raised beforehand to bring the steam chest to 210°F. very rapidly. After this the current is reduced and the temperature maintained for another 10 to 15 minutes. This is the principle of sterilisation in the chest, namely, that all apparatus in the chest must be brought up to 210°F. and maintained at that temperature for at least ten minutes. Naturally, to determine this, a thermometer is placed at the side of the chest and away from the steam inlet. A boiler, as I have mentioned, is economical, especially if covered with asbestos paste, and is simple to operate and safe to handle, if ordinary care is observed. The low pressure boiler raises steam to one or two pounds pressure per square inch. The difference in price is now negligible. At one time there was an appreciable difference in the price, which influenced some producers under our care to purchase the low pressure boiler. Now, however, I would not recommend them except for the small supplier, dealing with from 10 to 15 gallons of milk daily. Current steam such as issues from a kettle or pot can be utilised by the small producer if he has an ordinary open farm boiler or copper. The boiler must be covered; through the centre of the cover passes a two-inch pipe projecting three inches upward so that a current of steam may be directed into a steam chest, which must necessarily be small. The advantage of this system is the price. It takes a longer time to complete sterilisation, and I would advise that when the temperature of the utensils reaches 210°F. steaming should be continued for another 15 minutes. I have seen current steam used in many ways. I saw a strong corn bin doing valiant service. Water was poured into the bottom of the bin; over this was supported a perforated sheet of galvanised iron, and on this were placed the utensils to be sterilised. The lid was well pressed down and three or four primus stoves were applied to the bottom. When sterilisation was complete the stoves were removed and the bin remained closed until the utensils were required for the next milking. The boiler should be placed outside the dairy and the steam pipes should not be near the water pipes to the cooler.

The steam chest consists of a strong galvanised box, the size of which is determined by the number of utensils, bottles, etc., to be sterilised and the capacity of the boiler, or rather one should say that the capacity of the boiler should be determined by the size of the steam chest that is required. These chests are of a standard pattern, are made of strong material, have a strong door, steam pipe with valve, a wooden platform on the bottom, a drainage tap and a thermometer at the side. The chest should rest on a stand, so as not to be in contact with stone or cement, and if possible, it should be covered with some heat-retaining substance. Many of our local producers considered these chests too dear, so we fitted up a galvanised storage tank with a cover, which could be clamped on, and the other necessary fittings at a reasonable price. For sterilising, turn on the steam, slowly at first, and open the drainage tap. Gradually increase the steam, and when the tap has ceased to drip close it. When sterilisation is complete, do not open the chest too soon, as the cold air breaks glass. As far as possible, all apparatus should be left in the chest until required. Any form of hygienic box or bin may act as a steam chest, provided it holds the steam reasonably well. Let me warn you, however, that when using a high-pressure boiler the chest should not be absolutely sealed, as it is not made to stand such high pressure. In practice, however, there is always some escape at the door. For the open boiler, a dustbin makes an admirable steam chest. It can be perforated at the end in two places, at the centre for the steam pipe and at the side for drainage.

A boiling pot is also necessary to sterilise such utensils as nail and other brushes and all towels, including those used on the cows, as obviously they collect dung and are very dangerous. The steam chest is not suitable for these things. I once saw a case where serious trouble was traced to a nail brush. It was found to be impregnated with *B. coli*.

The time of sterilisation may alter the economy of the process. The morning utensils are washed after milking and placed in the steam chest; they are not sterilised until about an hour before the evening milking. The boiler is kept going during this milking, after which all utensils are washed and sterilised. In this way steam is raised only once a day.

A steaming stool consists of a steam pipe turned up at the end, which can shoot a jet of steam into a churn or bucket. It should be supported on a stool, so that the inverted churn or bucket can rest over the jet. With steam under pressure a 10- to 15-gallon churn is sterilised in five minutes, and a bucket or pail in three minutes. With current steam the churn or bucket is sterile about four or five minutes after the lip has become unbearably hot.

Before leaving this part, I must refer to the milking machine. It must be used with great

care, because milk and moisture can collect in so many places. In using a milking machine the same care must be taken of the cows; in fact, one must be much more careful in observing the fore-milk. The hands should not touch the inside of the teat-cups. The chief feature of a milking machine from this point of view is the ease with which the milking unit can be dismantled, washed and sterilised, as well as the construction of the pipe line and other parts, so that no milk or moisture may collect which can later drip into the milk. All parts in contact with milk must be washed and sterilised. To do this the parts must be separated, for rubber should not be sterilised in contact with metal, as its life is considerably shortened. All rubber parts should be suspended in a muslin bag in the steam chest. When these parts are being re-assembled, the apparatus for this purpose should be sterile and the hands thoroughly washed. The vacuum pipe line requires special attention, owing to the fact that moisture may collect in it which may later drip into the pail. The line should be constructed in sloping sections, with a drainage tap at the end of each section, and the vacuum supply taps should be directed upwards. All the taps should be opened and air drawn through them for three minutes before and after milking. At least once a week two gallons of hot washing soda-water should be drawn through the whole pipe line into the vacuum tank, where it can be drained off. Needless to mention, the strippings must be drawn into a covered pail and every care must be exercised when doing so.

For household purposes, milk should be delivered in capped bottles or else in sealed churns, with mushroom-shaped covers, to a registered bottling establishment. Only in an emergency would I allow milk to be delivered from a churn, and then only on the condition that the milk was drawn from a tap into a covered pail, fitted with a spout and measured with a special covered measure. The open churn and bucket with dipping measure are a disgrace to civilisation.

In fairness to the producer and to herself, the house-wife should know how to treat clean milk. If delivered in bottles it should not be removed from them except for immediate use, and should be stored in a cold larder, preferably on a stone floor. In warm weather, each bottle should rest in a saucer of water covered with absorbent muslin, so that the ends of the muslin dip well into the water. If placed in a draught the temperature of the milk will be maintained at 5°F. below that of the surrounding atmosphere. If delivery is from a churn the housewife should have a sterile covered enamel or aluminium jug. This can be sterilised in the oven, in boiling water, or by holding over the spout of a boiling kettle for three minutes.

As clean milk is delivered only once a day, the problem (for the producer) of storing the evening's milk in summer time deserves special consideration. A refrigerator is an ideal thing, but we are out to cut down expense so as to stimulate the production of all the more clean milk. The following answers the purpose satisfactorily: At the north side of the dairy dig a space into the ground big enough to contain whatever milk churns, bottles, etc., one may have after the evening's milking. It should be lined with cement or bricks and be about five feet deep; the sides should project about six inches above the level of the ground. The cover should be made of wood about two inches thick. The various churns, etc., can be removed into and out of this compartment by means of hooks. The temperature here is several degrees below that of the atmosphere above.

I think I have now put before you the general principles and some of the more important details of milk hygiene. It now remains to give you an idea of the standards of cleanliness and methods of milk control. It is obvious to you now that the cleanliness of milk is to be determined by the type and number of bacteria present in it. First of all, no organism dangerous to man must be present, and the milk from a cow suffering from any condition which makes it dangerous or unwholesome must not be used. In this respect control is largely exercised by visiting the herds and examining cows for any condition which may come under these headings. As far as the laboratory examination of the milk is concerned, the ordinary routine is to centrifuge a sample and examine the deposit for evidence of tuberculosis, mastitis or any other abnormality. The microscopic examination does not always give satisfactory results and cultures may have to be made. The presence or absence of tuberculosis is not always satisfactorily determined except by the guinea-pig test which, unfortunately, is slow. Actually you can take it that the control of disease can only be carried out by systematic and periodic examination of the cows.

With regard to cleanliness, we follow the standards and methods laid down by the Milk (Special Designations) Order, 1923, and the subsequent regulations in connection with it. There are two standards which concern raw milk. Grade A milk must not contain, at the time of delivery to the consumer, more than 200,000 bacteria per cubic centimetre, and *B. coli* must be absent in 1/100 c.c. Certified milk must not contain more than 30,000 bacteria per c.c. and *B. coli* must be absent in every 1/10 c.c. As you know, for "Grade A" the cows must be free from clinical tuberculosis and other diseases which may endanger the milk supply, while for "Certified" they must be tuberculin tested every six months until the herd is definitely free from reactors, when the test may be

reduced to once a year. For our clean milk scheme here the standard we follow is "Grade A." Four or five ounces of milk are collected at a depôt soon after delivery. It is brought back to the laboratory and placed in a cool place until everything is ready for testing. As you realise, we determine the total numbers of bacteria present in one cubic centimetre and the presence or absence of *B. coli* in 1/100 c.c. of the milk. The method is as follows: The milk bottle containing the samples is shaken 20 times; one c.c. is then delivered into a test tube containing 9 c.cs. of sterile saline. From this mixture one c.c. is delivered into another 9 c.cs. of saline, and from the latter another c.c. into a third test tube. Each c.c. in the test tubes 1, 2 and 3 will contain 1/10th, 1/100th and 1/1,000th c.c. of milk. For the *B. coli* test we use a standard liquid medium consisting of peptone, lactose and bile salts. This medium is filled into test tubes, each containing a small inverted Durham or gas tube, the latter being filled with the medium. If *B. coli* is present in the 1/100 c.c. of milk which is added to this medium, it breaks up the lactose, forming gas which is collected and observed in the gas tube. Three such tubes are inoculated with each sample of milk; they are incubated at 37°C. for 48 hours and the results noted.

For counting the bacteria a standard solid medium is used consisting of peptone, lemco and agar. This is already prepared in test tubes and is melted and cooled down to 43°C. in a water bath. Two sterile petri dishes, A and B, are ready on the table. Into A, 1/100 c.c. is added and into B 1/1,000 c.c. of milk. Agar is next poured into each plate. This soon solidifies and the plates are then placed in the incubator at 37°C. for 48 hours. The colonies of bacteria visible under a hand lens are then counted and the total number per c.c. easily calculated.

In addition to the performance of these tests the keeping quality is estimated. The milk samples are kept at 60°F. At intervals they are tested by taste, smell and by boiling. Their keeping quality is estimated from the time of milking to the time they clot or taste or smell sour. The keeping quality of samples which come within the "Grade A" standard varies from two days to about six days.

The principal control must be exercised on the farms, as in the case of diseases. Here we instruct owners, milkers and attendants on clean milk methods. They are advised as to alterations in buildings and equipment to be provided depending on the circumstances of each individual. Afterwards the carrying out of instructions, working of machinery, etc., must be watched. Accidents happen. A sample of milk does not reach the required standard; the fault has to be traced. In tracing the faults apparatus may have to be washed down with sterile saline and the washings examined. Milk bottles may have to be tested for sterility with litmus milk. The milkers have to be observed for faults, etc. The fault may be in the cows, perhaps there may be a case of mastitis or metritis, etc., in the herd. It is clear that the trained eye of the expert and his advice on the spot must have the greatest influence.

To complete my paper, it is necessary to say a few words on pasteurisation. Pasteurisation, within the meaning of the law, means that milk must be heated to between 145°F. and 150°F. for at least 30 minutes and then immediately cooled down to not more than 55°F. The milk must not have been previously treated by heat and the apparatus and methods used must be passed by the Licensing Authority. When delivered to the consumer, pasteurised milk must not contain more than 100,000 bacteria per c.c. There is no *B. coli* test. Pasteurisation as I have described, carried out under ideal conditions, destroys or devitalises all the ordinary pathogenic and considerably reduces the number of non-pathogenic contaminating bacteria except the thermophilic bacteria, some varieties of which may actually increase. In actual practice, commercially, pasteurisation is by no means a reliable method of purifying what is previously contaminated. The whole idea of pasteurisation in these countries is wrong. It pre-supposes dirty milk. It is an incentive to dirty methods. It begins at the wrong end. Therefore we, as a profession, cannot support pasteurisation because we know that we can guarantee a plentiful supply of healthy milk. We can control animal disease; we can provide the people with wholesome animal food products; we are the only impregnable barrier between animal disease and mankind, but we are not allowed our rightful place in the struggle for health. Consequently thousands of humans are dead or suffering in this country and elsewhere who could have lived longer in health or be still alive and healthy. We are a learned and scientific profession with definite methods of eliminating disease based on scientific research. There is no reason from our point of view why a single drop of diseased milk or a single piece of diseased meat should be consumed.

How much longer are the people to be denied the fruits of our labours? The time for dilly-dally is over; too long have we neglected our duty to our fellow citizens and to one another. I say neglected, because we can do good, and it is our duty to fight against obstruction in order to do that good. You have shown your interest in your work by coming, some of you at great inconvenience, to study the results of our labours here. Are you going to allow that interest to be stifled in you?

There is a big field before us, there is a lot of work to be done, and I appeal to you all to set about your task at once, first by becoming individually masters of your job and then by putting your shoulders to the wheel in united effort.

### Discussion

The Chairman (Mr. C. P. Hynes), referred in eulogistic terms to Mr. Harnett's demonstrations and to his paper, the keeping of which would be of value for future reference. The paper was now open for discussion and Mr. Harnett was prepared to answer any questions that might be asked on the subject.

Mr. S. Hyde thanked Mr. Harnett for his instructive demonstration and for his excellent paper. He asked how the bacterial counts in the three dairies which they had visited compared with one another. The washing room, he thought, should be separate altogether from the bottling room, because traffic such as passed in the washing department entailed the introduction of dirt which was liable to get in contact with the milk during the bottling process in the same room. Much expense was often incurred in replacing bottles damaged during sterilisation and he wondered if there was any means of preventing such damage: was turning on the steam too rapidly to the steriliser responsible? In his view the ideal way to retail milk was in bottles, and this really should be insisted on in the case of chilled milk. We would thus avoid the unfair or uneven distribution of fats, as happened in chilled milk when delivered in bulk.

Mr. W. O'Callaghan observed that Mr. Harnett's paper was, perhaps, meticulous in its detail but truly indicated the way to our ultimate goal —a clean milk supply. At present, however, we should move cautiously and with their knowledge, as veterinary inspectors, of the actual conditions existing in dairies, they should advise reasonable and practical standards at first; otherwise there would be no milk.

It was most important that the cause of failure in all efforts, so far, at providing clean milk should be understood and avoided. Hitherto highly technical Orders had been handed over for administration to Local Authorities—Boards of Health or County Councils. These bodies were composed of laymen, unqualified to understand, and they were permitted to regard the important and onerous duties as merely formal and worthy only of trivial remuneration—£20-£40 per annum —for combined meat and milk inspection. It was not evident that the Central Authority itself had got a clear conception of the onerous nature of the duties of a Veterinary Inspector. They might be readily understood by reading Mr. Harnett's paper and he commended it for that purpose to the Central Authority. It should then advise the Local Authorities in the matter of remuneration for such work on from six to ten dairies, the average number in a Rural Area.

Mr. R. R. Pierse expressed high appreciation of Mr. Harnett's paper. If he learned as much at every meeting which he hoped to attend, he would surely become very wise indeed. He was somewhat alarmed at the high percentage of cases of tuberculous metritis as recorded by Mr. Harnett, as he was of the opinion that they did not exceed 0·2 per cent. There were other acid-fast bacilli which might be confused with the tubercle bacillus if one relied, solely, on microscopic examination. He thought it would be rather difficult to identify Bang's bacillus by microscopical examination of milk samples and there was even some difficulty in doing so biologically.

There were good grounds for supposing that undulant fever was transmitted through the milk from affected cows. After all, "Malta Fever" got the name from the disease being met with in the soldiers in Malta, after drinking the milk of affected goats.

Mr. J. J. Dundon said that he was intimately associated with Mr. Harnett in his work and had a high opinion of his ability. He was one of the leading authorities on the milk question.

Mr. Fred A. Heney (Dublin) observed that it had well repaid him to come down from Dublin to witness Mr. Harnett's delightful demonstration, and also to listen to his excellent paper, for which he expressed his sincere thanks.

He had learned much from the paper and would no doubt learn more on reading it when published. Mr. Harnett had not dealt in any detail with the milking of cows by mechanical means, and it would be interesting if he would refer to the method used immediately before, as well as to stripping the cow when the machine had ceased to withdraw the milk.

Mr. Heney went on to refer to the remuneration received by producers for tubercle-free milk, which he contended was not in keeping with the cost and trouble involved in production. In his opinion the essayist had made such a strong case for the production of clean milk, that it would well repay the Department of Agriculture to make arrangements for men such as the essayist to be sent into the country to teach the people how to produce and handle milk to ensure its purity for the consumer. Referring to the Milk Bill, recently introduced, it was his opinion that the Veterinary Profession should carefully study this document, and see if it afforded sufficient opportunity for them to prove conclusively that they were specially capable of securing to the public at large the benefits to be derived from this Bill. In his opinion, veterinarians could do all that was required of them; let them see to it that they were given their proper place in the campaign to bring about the much desired revolution in the production and handling of milk. A clean milk supply was a matter of the greatest importance to the rising generation.

Mr. Harnett had shown that he was fully alive to the great importance of the subject and had given much of his time, even to encroaching upon his holiday, in gaining further knowledge of his subject.

The Chairman said it was true that their work was not published in the Press. He called upon Mr. Harnett to reply to the speakers.

#### The Reply

Mr. P. Harnett thanked the members present for the way in which they had received his paper. He felt that he might perhaps say that Mr. Dundon and he worked unselfishly in the matter of clean milk production; they lost time and recreation in the work. The Veterinary Profession held the knowledge on the question of animal products; it was their domain. They in Limerick had sacrificed many other things to acquire the necessary knowledge for efficiency in the work they had undertaken. He was delighted with the number of practitioners who came to the meeting, many of whom had travelled very long journeys.

With regard to Mr. Hyde's question *re* the bacterial count in the milk from the farms visited, the lowest count was obtained from the small farm with the simplest methods, but in which cleanliness was most scrupulously observed in the

ordinary work of milking the cows and handling the milk. In the second farm, wet milking was carried out and on this account the results, though good, were not so satisfactory as in the small farm. In the remaining farm the milking machine was in use. The use of a milking machine did not necessarily mean the production of clean milk; sometimes bad counts were obtained owing to contamination through the pipe-line. This could be reduced by passing a hot solution of soda through the pipe once a week. He knew of no remedy for the cracking of bottles in sterilising. He made it clear, however, that elaborate equipment was not necessary for the production of "Grade A" milk, as was exemplified in the case of the small dairy farm referred to. When the proprietress of this farm was asked what it cost her to produce "Grade A" milk she said it cost her nothing extra. The secret of her success was cleanliness.

Regarding the communicability of undulant fever to man from animals harbouring the *Brucella abortus*, it was an established fact that it did occur. At the National Veterinary Congress at Folkestone several of the members present were subjected to a test and a large proportion of them reacted. One half of the veterinary surgeons employed on the staff at the Weybridge Laboratory suffered from undulant fever and several reacted to the test. The symptoms shown by those actually affected by the disease were headache, intermittent fever and pain at the level of the costal cartilages.

He thanked Mr. Dundon for his appreciation, which he warmly reciprocated. Mr. Dundon was an example to the Profession and no person could do more than he did to further its interests. (Applause.) He was also indebted to Mr. Heney for his complimentary references to his demonstration and paper.

As regards the milking machine, the pipe-line was the difficulty in preventing contamination, but modern improvements in the machinery had overcome this difficulty. He agreed that the price obtainable for "Grade A" milk was inadequate. In some cases in Limerick the producers of this milk were obliged to send some of it to the creamery. In England, legislation was being introduced whereby the price of milk would be controlled so as to give the producer a fair price in accordance with his outlay. The Medical Profession said that the production of clean milk was impossible and were all out for pasteurisation. He was strongly opposed to depending on pasteurisation; it encouraged the production of dirty milk. The days of dirty milk had gone in England and it behoved the Veterinary Profession in Ireland to bring about the same state of affairs in that country.


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# Clinical Communication

## HYSTERECTOMY AND SPLENECTOMY IN THE BITCH

E. P. Barrett, m.r.c.v.s.,
Margate

*Subject.*—An eight-year-old wire-haired fox-terrier bitch, weighing 22 lb.

*History.*—April, 1934. The bitch had been showing persistent œstrum for six weeks, with symptoms of nymphomania. Otherwise, health appeared to be excellent. Nearly three years previously, the animal was affected with symmetrical enlargement of numerous superficial lymphatic glands. Hodgkin's disease was diagnosed and a grave prognosis given. Without treatment, however, the condition subsided and the animal remained in perfect health.

*Examination.*—Abdominal palpation revealed a freely-movable enlargement, a little larger than a golf ball, in the ventral part of the abdomen. No other abnormality was discovered other than the signs of œstrum.

*Diagnosis.*—The enlargement in the abdomen was thought to be a neoplasm, but in what organ or tissue was not decided. Nymphomania was thought to be due to ovarian cysts. An exploratory laparotomy was suggested—to determine the nature of the abnormality—and if it should prove possible to remove it, this was to be done, together with ovaro-hysterectomy; otherwise, the animal was to be destroyed.

### EXPLORATORY LAPAROTOMY AND OPERATION

The bitch was prepared for the operation by administering laxatives for a few days previously, and by giving glucose in the drinking water.

She was admitted to hospital on April 7th, and was given an enema the following morning, to empty the colon. The abdomen was shaved, washed, cleaned with æther and painted with tincture of iodine. Four-and-a-half grains of nembutal in solution were given by intraperitoneal injection. Light anæsthesia was induced in about 20 minutes.

Overalls were dry sterilised, as also were the operating cloths, as it was considered that less body heat would be lost than would be the case if the latter were boiled and used wet. The instruments, after having been boiled, were placed upon a glass slab, previously disinfected with a pure liquefied carbolic acid, and covered with a sterile cloth.

Complete anæsthesia was obtained by bubbling oxygen through æther.

An incision was made, slightly to one side of the linea alba, and about 2½ inches long, through the skin and muscular layers. The peritoneum was then picked up with forceps, punctured, and the incision extended to correspond with that through the skin and muscle.

Digital exploration revealed the spleen to be five or six times the normal size, and with a further enlargement about the size of a golf ball in the lower third. Neoplasm was suspected, and it was decided to perform splenectomy.

The splenic branches of the gastro-splenic artery, together with the satellite veins, were ligatured with silk. Some difficulty was encountered at the dorsal end of the spleen, where it is in close apposition to the greater curvature of the stomach. Care had to be taken not to ligature the main gastro-splenic trunk, as this would have resulted in passive congestion of the stomach until collateral circulation was set up. The spleen capsule was accidentally ruptured whilst the organ was being separated, and owing to its congested state considerable hæmorrhage resulted.

While splenectomy was being performed, the respirations had become shallower, and the pulse was fast and weak. One c.c. of coramine, a circulatory and respiratory stimulant, was administered intramuscularly. There followed a rapid but somewhat transient increase in both depth and frequency of respiratory movements. Eight ounces of glucose saline were then injected subcutaneously.

The presence of a cystic ovary accounted for the persistent œstrum, and rupturing of this would probably have overcome the condition, but it was considered advisable to perform hysterectomy to avoid the possibility of recurrence and because an improvement in health and spirits in elderly bitches had been observed after this operation.

Breathing had now practically ceased, and as no carbon dioxide was available, this was obtained by the interaction between dilute hydrochloric acid and sodium bicarbonate. Artificial respiration was practised and there was an almost instantaneous onset of deep respirations. Later, oxygen was given in small quantities from an oxygen cylinder, and the evolution of carbon dioxide was continued for some time.

No great difficulty was experienced in removing the uterus and ovaries, the ovarian and uterine vessels being ligatured with silk. The uterine stump was closed by Czerny-Lembert sutures of No. 00 catgut, and the omentum was sutured over it. The abdominal muscles were sutured with No. 0 catgut, the mammary tissue was drawn together in three or four places with the same material, while the skin was stitched with silk-worm gut. A sterile pad of cotton-wool was then applied, and held in position by a bandage.

*After-Treatment.*—After completion of the operation the bitch's temperature was 95°F. The pulse was weak, and the respirations shallow but regular.

Sixty c.cs. of a 6 per cent. solution of gum acacia in normal saline were now given intravenously. The gum gives the saline solution the same viscosity as blood, and thus renders the resultant rise of blood pressure more lasting than would be the case if normal saline alone were used.

The patient was kept warm and given 1 c.c. of pituitrin intramuscularly at intervals of four to six hours.

The same evening, 5 oz. of glucose saline were administered subcutaneously, and the animal having recovered from the anæsthetic, milk and glucose, and water and glucose were offered and occasionally lapped.

Some vomiting occurred on the following morning, but was checked by a dessertspoonful of soda water, given at half-hourly intervals. The temperature rose to normal, and showed only a few slight undulations on the following days.

As the bitch was naturally a capricious feeder, she was discharged from hospital on the fourth day after the operation.

The wound healed by first intention, and the stitches were taken out on the seventh day. Steady but consistent progress was reported by the owners from the time she went home.

Discussion.—This operation may seem to have been more than a little ambitious, especially as the uterus was removed while the patient was suffering considerably from surgical shock, but the owner would have preferred the bitch to be destroyed rather than to have had her with only one of the conditions treated. A decision has to be arrived at rapidly when once the abdomen has been opened, and consequently both operations were undertaken.

The results amply justified the somewhat hazardous undertaking.

Owing to the fact that the operation was performed on a Sunday, the spleen did not arrive at the laboratory for examination until 48 hours after removal.

*Laboratory Report.*—Mr. A. B. Orr, Royal Veterinary College, made the following report: "The spherical swelling about the size of a golf ball or larger, which is present in the spleen, appears to be a large hæmorrhage, parts of which had become organised. The rest of the organ showed a very congested pulp, but unfortunately the specimen was very decomposed, and had undergone considerable softening. I understand that this animal showed a bilateral enlargement of the lymphatic glands some time ago, suggesting the possibility of the so-called Hodgkin's disease. The spleen, however, did not show the changes which one usually finds in this condition."

Outcome.—Five months after the operation, the animal is, in the words of the owner, "younger than she has been for years," and has killed and brought home several hedgehogs during the summer.

# Report

## PROCEEDINGS UNDER THE DISEASES OF ANIMALS ACTS FOR THE YEAR 1933

### PART I.—POSITION OF GREAT BRITAIN WITH REGARD TO CONTAGIOUS ANIMAL DISEASES

Great Britain continued to be free from any visitations of cattle plague (rinderpest), contagious pleuro-pneumonia, sheep-pox, rabies, epizoötic lymphangitis, and glanders and farcy. The last occasions when these serious diseases were reported were: cattle plague, 1877; contagious pleuro-pneumonia, 1898; sheep-pox, 1850; rabies, 1922; epizoötic lymphangitis, 1906; glanders and farcy, 1928.

Foot-and-Mouth Disease.—Eighty-seven outbreaks were reported during the year, *viz.*, 54 outbreaks in the first quarter of the year, and 22 outbreaks in October. The numbers of animals slaughtered on account of the disease were: cattle, 3,359; sheep, 3,084; pigs, 1,359; and goats, three; the total compensation paid being £72,398 12s. 9d. Twenty-two English counties and one Welsh county were involved. A widely-distributed but connected series of outbreaks occurred during January in the Midlands and South of England, which series was traceable to consignments of pigs from Reading, through Leicester Cattle Market, the City Abattoir, Birmingham, and the Tonbridge Market. Six outbreaks were confirmed in Buckinghamshire during February, and three new centres of disease affecting 14 premises arose during March in Leicestershire, Warwickshire and Derbyshire. Wiltshire had a visitation in May, the Basingstoke district of Hampshire in August and September, and Hertfordshire, Isle of Ely, Lincolnshire, Somerset and Derby during October. No outbreaks occurred in any part of Great Britain after October 31st. There were no outbreaks in Scotland.

Though slaughter remains the basis of the existing policy of eradication of the disease, the use of serum treatment in connection with certain field outbreaks with a view to limiting spread was continued as an experimental measure during 1933. While serum usually affords protection to an animal for a period of about ten days, it does not contain curative properties, nor will it prevent the development of disease in animals already in the incubative stage. During the year 1933 serum was used in connection with 15 outbreaks, and was administered to 1,322 animals, comprising 730 cattle, 441 sheep and 151 pigs, on account of the risk of their exposure to infection. In some cases the treated animals were stock accommodated on premises contiguous or in close proximity to infected premises, but in the majority of cases the risk of infection arose from the movements of the stock owners or their employees or of other persons, or of vehicles, livestock or ground game, or from the possible contamination of feeding stuffs. In two cases disease developed in animals which had been treated with serum, in both of which infection would appear to have been acquired before the serum was administered, and possibly through some indirect agency.

Bovine Tuberculosis.—During the year, tuberculosis under the various forms referred to in the Tuberculosis Order of 1925 was reported on 23,608 premises in Great Britain as compared with 22,014 premises in 1932. The number of animals examined on these premises by veterinary inspectors was 350,550 as compared with 302,354 in 1932. As a result of the examinations, 21,085 cattle were reported by inspectors as coming within the Order relating to compulsory slaughter. This was 1,886 animals over the previous year, and the largest total reached in any one year since the commencement of the operation of the Tuberculosis Order of 1925. The figure includes 13,227 cows in milk, 7,191 other cows and heifers, and 667 other bovines. The forms of the disease from which the animals were reported to be suffering were: giving tuberculous milk, 661 animals; tuberculosis of the udder, 3,109; tuberculous emaciation, 8,028; chronic cough with clinical signs of tuberculosis, 9,287. The results of *post-mortem* examinations were 121, or 0·6 per cent., not affected; 6,827, or 32·6 per cent., non-advanced; and 13,960, or 66·8 per cent., advanced cases. The total amount of compensation paid by local authorities was £71,826 18s. 11d., or an average of £3 8s. 8d. per animal. The amount claimed by local authorities from the Ministry under the 75 per cent. refund was £53,870 and the proceeds of salvage from the sale of carcases of animals slaughtered was £14,528 15s. 11d.

An interesting table of the report gives the total bovine population of England and Wales at 6,620,188, and of Scotland at 1,293,637, which is an increase on 1932 of 262,173 and 60,374 respectively.

Sheep Scab.—There were 578 outbreaks of sheep scab reported during the year, which was an increase of 217 outbreaks, or 60 per cent., on the year previous. Four hundred and two outbreaks occurred in England, 144 outbreaks in Wales, and 32 in Scotland. Most of the outbreaks in England were in counties bordering the Pennine range of hills, *viz.*, Cumberland, Derby, Durham, Lancs., Westmorland, Yorks. (N.R.) and Yorks.(W.R.). The existence of the disease was not discovered until the September double-dipping period, when 34 out-

breaks were found by the Ministry's inspectors on the moorlands of the Derbyshire Peak District. In no case had its suspected existence been reported by the owners to the police, as required by the Sheep Scab Order of 1928, and the manner in which the statutory dippings were conducted revealed many unsatisfactory features. Altogether there were 72 outbreaks in Derbyshire, 57 in Cumberland, 19 in Durham, 29 in Lancashire, 45 in Westmorland, 29 in the North Riding of Yorkshire and 78 in the West Riding of Yorkshire. The full facts of the situation were placed before local authorities, and a Conference of Representatives of Local Authorities of all the northern counties of England was held at the Ministry's offices on November 30th. As a result of this conference the interest and activity of all concerned were stimulated and considerable progress was made in the steps required to check and reduce the prevalence of the disease. The majority of the local authorities agreed to appoint patrol shepherds, and certain counties decided to make some additions to their whole-time veterinary staffs. Special Orders of the Ministry were also made restricting movement and requiring the further double dipping of sheep in the badly-affected areas bordering on the Pennine Range. On December 14th, 1933, the Chief Veterinary Officer attended a meeting at the headquarters of the National Farmers' Union in London of representatives of the northern county branches of the union, and appealed to all present at the meeting to use their influence to persuade all sheep farmers in their districts to recognise the seriousness of the position and to do their part without delay in the eradication measures which the authorities were putting into force. The representatives of the union stated that they were prepared to support the Ministry in these measures.

In the counties of England outside the Pennine Range group, 73 outbreaks of disease were confirmed. In Wales 144 outbreaks were confirmed, 130 being in the North Wales counties of Merioneth, Denbigh, Cærnarvon, Anglesey and Flint. Merioneth was the most heavily infected county, 91 of the 130 outbreaks, or 70 per cent., occurring in Merioneth sheep. The Chief Veterinary Officer attended a meeting of representative farmers at Dolgelley, and explained the unsatisfactory position of North Wales with regard to sheep scab, and he also had personal interviews with the Chief Constables of Merionethshire, Anglesey and Cærnarvon, and stressed the advantage of appointing patrol shepherds to assist in bringing to light unreported cases. In Scotland 16 outbreaks were confirmed on the mainland, and 16 in the Outer Hebrides. During the year 1933, eleven sheep dips were approved for use under the Orders of the Minister relating to sheep scab and sheep dipping. On December 31st, 1933, there were 281 approved dips, *viz.*, 197 tar acid dips, 80 arsenic dips, three lime and sulphur dips, and one soda sulphide dip.

Swine Fever.—The number of suspected outbreaks of swine fever reported during the year was 11,036. Of these, 1,414, or 12·8 per cent., were confirmed after veterinary examination on the premises and at the Ministry's laboratory. Of this number 1,248 occurred in England, 22 in Scotland, and 144 in Wales. In 937 (66·3 per cent.) of the confirmed outbreaks the diagnosis was established on the first visit, and in the remaining 477 cases (33·7 per cent.) two or more visits were necessary to establish the existence of the disease. The number of swine slaughtered by the Ministry's inspectors for diagnostic purposes in connection with all reported outbreaks investigated was 3,075, and the compensation paid to owners amounted to £2,003. The aggregate losses in pigs which died or were destroyed on account of swine fever in 1933 amounted to 35 per cent. of the pigs on the infected premises. During the year there were 1,624 cases which had been reported as suspected swine fever, and in which the veterinary inspector making the diagnostic inquiry suspected the cause of illness or death to be swine erysipelas; of these cases the diagnosis in 1,461 was found to be positive to swine erysipelas on further investigation. A satisfactory method of control of this disease is available and is described in the Ministry's Advisory Leaflet No. 17. The number of cases of swine erysipelas above-mentioned is not to be regarded as representing the extent of that disease in Great Britain.

Anthrax.—During the year 297 outbreaks of anthrax were confirmed, a decrease of 47, or nearly 11 per cent., on last year's figures. Of the 297 outbreaks, 152 occurred in England, a decrease of 48 from 1932; 140 in Scotland, an increase of one; and five in Wales, which is the same figure as for 1932. The species and number of animals attacked were 335 cattle, one sheep, four pigs and five horses, making a total of 345 animals. Disease was confirmed twice on each of 13 premises, and three times on one other premises during 1933, *i.e.*, outbreaks on 14 premises may have arisen from a previous outbreak during the same year. In addition, there were 29 outbreaks on premises where disease was known to have existed during the previous five years. Of 253 outbreaks unconnected with any previous case, 184 were probably through the use of imported feeding stuffs, and in 32 instances no explanation was available.

Parasitic Mange of Equine Animals.—The prevalence of this disease has satisfactorily declined since 1920, when there were 3,551 outbreaks, 132 outbreaks in 38 counties being reported by local authorities in Great Britain during the year. In England 33 counties were

involved, Norfolk heading the list with 18 outbreaks, Gloucester five, Kent ten, Leicester five, Middlesex five, and Wiltshire six; Essex, which headed the list in 1932 with 14 outbreaks, showed eight outbreaks in 1933. Four outbreaks were reported from Wales as compared with one in 1932. In Scotland there were three outbreaks in two counties as compared with nine outbreaks in six counties in 1932.

Glanders.—Great Britain has been free from this disease for five consecutive years. The precautions adopted under the Importation of Horses, Asses and Mules Orders of 1921 and 1922 have succeeded in preventing the introduction of this disease from abroad.

## PART II.—IMPORTATION: PREVENTIVE DISEASE MEASURES

In consequence of the Foot-and-Mouth Disease Research Committee having proved the survival of the virus of that disease in the bone marrow of the carcases of affected animals for considerable periods, the committee, in their findings, fully endorse the case for the imposition and maintenance of the embargo on the importation of meat from the Continent of Europe, which embargo was imposed in 1926. The beneficial results in reducing the sources of infection have been demonstrated beyond question. To provide further safeguards against the risk of infection, the Ministry made the Foot-and-Mouth Disease (Packing Materials) and (Boiling of Animal Foodstuffs) Orders, 1932. A measure of this risk is afforded by a study of the following figures showing the extent to which foot-and-mouth disease existed in the near European countries during 1933: Belgium, 28,755 outbreaks; Denmark, 759; France, 24,222; Germany, 1,044; Netherlands, 36,561. By way of comparison, the number of outbreaks in Great Britain was 87.

The importation of live animals from abroad during the year 1933 consisted of (*a*) cattle (of all classes) from Canada 51,408, landed at Birkenhead (chiefly), Glasgow, Cardiff and London; (*b*) cattle, sheep, swine and goats from Northern Ireland, Irish Free State, Channel Islands and the Isle of Man as follows: cattle, 711,910; sheep, 458,392; swine, 122,642; goats, 16; or a grand total of 1,292,960 animals. Of disease in imported animals, 180 cows, namely, 86 from the Irish Free State, 21 from Northern Ireland, and one from the Isle of Man were detained for examination suffering from induration of the udder. One came within the scope of the Tuberculosis Order and was slaughtered, *post-mortem* examination revealing advanced tuberculosis. The remaining 107 cows were released. There were 21 cases of sheep scab in 19 cargoes, eleven cases being from Northern Ireland, and ten cases from the Irish Free State.

## PART III.—PROTECTION OF ANIMALS DURING TRANSIT

The principal feature in the transport of animals by sea in 1933 was the increase in the number of Canadian cattle carried to Great Britain following on the extended facilities afforded under Section 8 of the Ottawa Agreements Act, 1932. The number of cattle of all classes shipped from Canada was 51,474, out of which 66 died, were killed, or were injured, the percentage casualties therefore being 0·128.

In the Irish trade the percentage of casualties was the lowest on record. Out of 1,285,179 animals carried, the total casualties were 296, or 0·023 per cent. In the Isle of Man trade, out of a total of 6,087 animals carried only one pig died.

On the Exportation of Horses side, only 3,179 were exported during the year as compared with 3,652 in 1932. In addition, 117 horses were presented for shipment at the ports, but were rejected by the veterinary inspectors as not being of the standard required under the provisions of the Diseases of Animals Act, 1910, and the Exportation of Horses Act, 1914. Only one casualty was reported among the horses carried to European ports during the year. Twenty-two horses were exported with certificates issued by the Jockey Club in respect to thoroughbred horses shipped to the Continent for racing or breeding purposes.

## PART IV.—EXPORT OF PEDIGREE AND OTHER STOCK

The number of animals that passed through the Quarantine Station, East India Dock, London, during the year 1933 was 295, *viz.*, 143 cattle, 132 sheep, two goats, and 18 pigs. This was a falling off from previous years. Canada appears for the first time in obtaining pedigree stock through the Quarantine Station, according to an agreement made at the Imperial Conference at Ottawa. Efforts to secure the acceptance by New Zealand of stock shipped direct from the London Quarantine Station were still unsuccessful. New Zealand, alone among the Dominions, still prohibits direct importation from the United Kingdom.

## PART V.—THE VETERINARY LABORATORY

In the examination of specimens received at the laboratory for purposes of diagnosis in suspected cases there were 3,422 of swine fever, of which 1,472 were positive and 1,950 negative; 454 of anthrax, of which 345 were positive and 109 negative; 216 of sheep scab, of which 210 were positive and six negative; five of rabies, of which all were negative.

Twenty-three thousand five hundred and eighty-one doses of anti-abortion "A" vaccine were supplied to veterinary surgeons for the inoculation of animals in herds affected with

epizoötic abortion. The number of agglutination tests carried out in connection with bovine abortion was 1,491.

The preparation of Calmette-Guèrin vaccine for tuberculosis (B.C.G.) was continued, and 1,392 doses were issued for inoculation of selected herds.

In the case of poultry, 182,210 agglutination tests were conducted. 427,356 doses of fowl-pox vaccine were issued for the inoculation of poultry against that disease. The number of doses of avian typhoid vaccine issued was 16,570.

Work was continued with contagious abortion in cattle, particular attention being directed to the occurrence of different strains of *Brucella abortus*, and the value of such strains for immunisation purposes.

In connection with tuberculosis, an experiment was carried out to test the extent to which infection will spread as a result of the contact of healthy with infected (inoculated) guinea-pigs.

The occurrence of lactation tetany was investigated in several different areas, and samples of blood were taken from suspected cases to determine whether hypomagnesæmia is a symptom or a cause of the condition, and whether intravenous or subcutaneous injections of magnesium salts might be useful therapeutically.

Work on the survival of the swine fever virus in carcases, and on the effect of pickling and smoking was concluded. The results were as follows: (1) The virus of swine fever survived 73 days in the bone-marrow of "salted" and "chilled" carcases; (2) the virus survived 17 days in the skin and muscles of pigs killed before the appearance of clinical symptoms; (3) the virus survived 42 days in salted skin and muscle of pigs killed after the appearance of clinical symptoms; (4) the virus survived for 37 days in bone-marrow and muscle, and for 19 days in skin, of smoked carcases.

A detailed study was made in regard to parasitic gastro-enteritis in lambs, and the development in lambs of an immunity towards the different species of worms associated with that disease.

Further work was conducted on gapeworms in chickens, Newcastle disease in fowls, infections of ducks with *B. ærtrycke*.

### PART VI. MISCELLANEOUS

The Chief Veterinary Officer and the Deputy Chief Veterinary Officer, Ministry of Agriculture, attended the Annual Meeting of the Committee of the International Office of Contagious Diseases of Animals (l'Office International des Epizooties) held in Paris in May 1933. The principal subjects discussed were foot-and-mouth disease, swine fever, the disinfection of motor vehicles used for the transit of animals, and contagious abortion in cattle.

The question of a Bill being introduced into Parliament to confer powers upon the Ministry of Agriculture to extend the Diseases of Animals Acts to poultry is under consideration. A very virulent form of fowl cholera, attended with considerable losses, amongst ducks in Norfolk and Suffolk was brought to the notice of the Ministry early in July, and it appeared from enquiry that it had been introduced in geese imported from Poland. A most serious outbreak of Newcastle disease affecting poultry was reported at King's Langley, Herts., in August from a farm containing 10,000 birds, of which about 6,000 died within three weeks. J. M.

# Abstracts

**[Foot-and-Mouth Disease: Specific Treatment, Eradication and Differential Diagnosis.** Traum, J. (Professor of Veterinary Science, Division of Veterinary Science, College of Agriculture, University of California). Paper No. 58, Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

The slaughter or stamping-out method has made it possible to free the United States from severe and extensive outbreaks of foot-and-mouth disease and to keep it free from this disease for long periods of time and thereby avoid serious interference in commerce involving the movement of livestock, agricultural, and other American products. This method, with our present knowledge, will continue to be invoked whenever a positive diagnosis of foot-and-mouth disease is made.

With the far-reaching effect of the pronouncement of foot-and-mouth disease in this country, it is perhaps more important for the establishment of a definite diagnosis than in countries or sections of countries in which the disease is enzoötic and against which there are constant quarantines by other geographical units and countries.

Vesicular stomatitis, when it appeared in cattle, was practically the only disease which gave the experienced observer any great difficulty in making a diagnosis, and no serious difficulties had been encountered until 1932 and 1933, when there appeared in garbage-fed hogs a disease indistinguishable from clinical and experimental foot-and-mouth disease or from experimental vesicular stomatitis, but which differed from both in its failure to induce the disease in any of a large number of guinea-pigs and in any of a fair number of bovines injected; and it further differed from foot-and-mouth disease in that, in 1933, it showed a slight pathogenicity for horses. Later, the virus was found,

in Washington (D.C.), to be immunologically different from vesicular stomatitis virus and at the Island of Riems, Germany, from foot-and-mouth disease virus. Vesicular exanthema of swine is proposed as the name for this disease.

Equine encephalomyelitis virus contained in pads of experimentally infected guinea-pigs induced an extremely mild form of vesicular lesions on the tongues of horses in three out of five attempts.

Attention is again called to the adaptation of foot-and-mouth disease virus for certain species and lack of pathogenicity for species which are ordinarily susceptible. Similar change in predilections might be expected of the viruses of vesicular stomatitis and vesicular exanthema of swine.

The possibilities and limitations of active and passive cross-immunity tests in making a differential diagnosis of diseases like foot-and-mouth disease are discussed.

Further studies to develop and improve the complement-fixation test, along the lines suggested by Ciuca, to a point where it may aid in diagnosis are considered desirable.

Until further information is available, outbreaks of vesicular exanthema of swine and vesicular stomatitis in the United States will not be subjected to the severe measures of eradication practised in foot-and-mouth disease, with their expensive and restrictive quarantines. Circumstances can be conceived, however, when, in a somewhat rapidly spreading disease like foot-and-mouth disease, in which a diagnosis is impossible for some time, it may be desirable to use the slaughter method without severe quarantines. This was successfully carried out in the 1933 outbreak of vesicular exanthema of swine.

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**[The Experimental Vaccination of Calves against Tuberculosis with B.C.G.** Buxton, J. Basil (Director of the Institute of Animal Pathology, University of Cambridge). Paper No. 78, Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

The merits and demerits of vaccination with B.C.G. were fully discussed at the preceding International Veterinary Congress. Because of the diversity of opinion concerning the harmlessness and the efficacy of the vaccine, it was inevitable that the majority of those present should decide to suspend judgment on these points pending further investigations.

The report summarises briefly much of the work which has been carried out in the intervening period, and gives the main features of investigations on the harmlessness and efficacy of B.C.G. in the vaccination of calves carried out at Cambridge by the writer, with Dr. A. Stanley Griffith and Mr. R. E. Glover.

The experiments with calves were begun in 1927 and are being continued. The evidence so far available shows that the strain of B.C.G. used throughout these experiments is avirulent for calves. Fifty-three animals have been inoculated intravenously with doses up to 200 mg. In no instance has there been any evidence of progressive tuberculosis.

Whether given by mouth or intratracheally, or by subcutaneous or intravenous injection, B.C.G. can raise the resistance of a calf to a virulent experimental infection. Intravenous injection, in our experience, has proved to be the most satisfactory method of vaccination with B.C.G.

The degree of increased resistance varies within wide limits and appears in general to be directly proportionate to the dose of vaccine. The dose considered by us to be most satisfactory consisted of 10 mg. followed three weeks later by 100 mg. given intravenously.

This double intravenous inoculation gave complete immunity, three months after vaccination, to the oral administration of virulent bovine cultures, which produced moderately severe local and slightly generalised tuberculosis in unprotected animals. There was a progressive decrease in resistance with the extension of the period between vaccination and the administration of the test dose. After an interval of six months, one animal out of five showed slight caseo-calcareous lesions in the mesenteric glands. After nine months, two animals out of seven showed similar isolated lesions. After twelve months, only one out of seven was entirely free from lesions. The lesions in the vaccinated animals were much less in extent and severity than in the controls.

Revaccination with a single intravenous dose of 100 mg. at intervals of six, nine and twelve months after the double protective inoculation, followed by a test dose six months later, showed that after the shortest interval three animals out of five were free from disease, whereas in one there was a single caseous lesion in a mesenteric gland. In the fifth there were several scattered caseous lesions in the mesenteric glands.

After a nine-month interval, three out of four calves were entirely free from lesions, whereas in the fourth a few lesions were found in the lymphatic glands of the head. After twelve months, two out of four animals showed no lesions, whereas one showed slight fibro-caseous lesions of four mesenteric glands, and one was affected with moderately severe lesions of several glands of the alimentary tract.

Experiments are now being undertaken to ascertain whether repeated revaccination at appropriate intervals over a period of several years will maintain the resistance of cattle to reinfection with virulent tubercle bacilli.

**[Recent Progress in Veterinary Surgery.** Hobday, Sir Frederick (Principal and Professor of Surgery in the Royal Veterinary College, London). Paper No. 74. Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

An increasing use of anæsthetics and of aseptic surgical technique has occurred in Great Britain since the last International Veterinary Congress. In the case of the smaller animals various types of surgical operations on the abdomen have become of every-day occurrence. In view of these developments the essential groundwork of aseptic and antiseptic surgery is being taught thoroughly in modern veterinary colleges.

Important adjuncts to progress in this field have been the electro-lethaler and an extended use of Roentgen rays, the latter being of special value in case of fractures and the detection of foreign bodies in tissues and the digestive tract. In this connection there is need for expert teaching of the reading of skiagraphs to prevent erroneous diagnosis.

In Great Britain chloroform is the favoured general anæsthetic for horses, cows and mature dogs; ether, A.C.E., or a mixture of chloroform and ether is preferred for cats and young pups. Two comparatively new anæsthetics, avertin and nembutal, have been the subjects of considerable research.

Difficult obstetrical operations in large animals have been aided by the introduction of epidural anæsthesia. Forssell's operation for crib-biting is now considered a "practical" operation, and the stripping of Morgagni's ventricles for "roaring" has gathered many adherents. The latter operation may be considered firmly established, since, when successful, it converts a useless animal into a useful one. However, the proportion of absolutely noiseless ones is only about 20 per cent. This operation is reported also to be successfully used on dogs to quiet persistent barking and night howling. The paper outlines the technique used in several of the newer surgical operations.

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**[X-Ray (Roentgen) Diagnostics and Therapy in Veterinary Practice.** Pommer, A. (Lecturer in Internal Medicine and X-ray Diagnostics, Assistant in the Medical Clinic of the Veterinary High School, Vienna, Austria. Paper No. 31, Twelfth Internat. Vet. Congress, New York, 1934. *Author's Summary.*]

Rapid progress in Roentgen diagnostics and therapy in veterinary medicine comparable with that in human medicine is hindered by the lack of veterinary roentgenologists. Veterinary roentgenology is used at present only by a few veterinary specialists. Roentgen institutes are incorporated in clinics, and those in charge have little time for roentgenologic work aside from the clinical service.

The Veterinary College in Vienna has created a central Roentgen institute which is at the disposal of all clinics and departments as well as of the veterinary practitioners. The man in charge is concerned only with roentgenology and is assisted by technically trained personnel.

The field of the veterinary roentgenologist comprises not only surgery but also the diseases of internal medicine and obstetrics. The roentgenologic experience necessary from the clinical standpoint is best acquired through steady cooperation with clinicians, practitioners and pathologists. The purpose is to facilitate the diagnosis of the clinicians.

The Roentgen diagnostics in small and large animals comprise the following fields: Fractures, systemic diseases of the skeleton, inflammatory diseases of the bone, bone tumours, joint diseases, diseases of the teeth, diseases of the nose and sinuses, diseases of the ear and parotid.

Fistulas can be demonstrated through contrast mediums (jodipin, barium rods). For diseases of the soft parts of the neck, breast and digestive tract, fluoroscopy is preferable. This makes it possible to observe motile processes such as deglutition, cardiac action, diaphragmatic excursions and peristalsis. The Roentgen picture serves for the determination of details, for example: Swellings and abscesses of the retropharyngeal and air-sac lymph glands in angina; changes in position and form of the trachea, struma, metastases of carcinomatous struma and enlargement of the thymus; diseases of the lung, especially in tuberculosis and cardiac diseases.

The contrast technique of the digestive tract of small animals with barium sulphuricum purissimum (Merck) enables one to determine the presence and position of visible and invisible foreign bodies in diseases of the œsophagus, stomach and intestines. The urethra and the bladder are demonstrated through contrast-filling with 10 to 20 per cent. solution of sodium bromide or potassium iodide, and the kidneys and ureters through intravenous excretion-pyelography with uroselectan or abrodil. Tumours in the abdominal cavity can be recognised through enlargement of the affected organs, displacement of adjacent organs, or sometimes through their characteristic shadow formation.

In obstetrics Roentgen rays are successfully used for the determination of pregnancy, the control of delivery, the diagnosis of pyometra and hydrometra, and new growths in the uterus and ovaries.

The experiences of the author with Roentgen therapy comprise a period of eight years and a

field of 38 indications. The principal fields are superficial dermatoses, diseases of the skin glands, keratoses, actinomycosis and streptotrichosis. Successful radiation therapy was also used in acute and subacute surgical inflammations, glandular fistulas, diseases of the joints, parenchymatous struma, prostatic hyperplasias, and new growths of glandular tissues, such as adenomas of sebaceous glands and adenocarcinomas.

Lymphatic leucæmia is favourably influenced but not for long. Radiation therapy of primary sarcomata and carcinomata is indicated only in inoperable cases; the results of post-operative radiation are better and more lasting.

A well-organised veterinary hospital, either concerned with surgical, interne, or obstetrical cases, must incorporate to-day a Roentgen institute in such a manner that the roentgenologist, as in human medicine, is consulted by the clinicians.

Fluoroscopy and Roentgen photography, in conjunction with clinical methods of examination, bring about an important improvement in the making of diagnoses. Superficial and deep therapy can help in many cases in which other remedies have failed.

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**[The Internal Parasites of Domestic Carnivores: A Survey.** Cameron, T. W. M. (1934.) *Vet. Jl.* Vol. 90, pp. 206-213.]

The author concludes this brief survey with the following remarks:—

"Domestic carnivores occupy an almost unique position among animals. Dogs and cats are kept in much more intimate contact with human beings than are other animals, and many of their diseases and parasites are transmissible to man, and some of these are among the most serious affecting mankind and domestic herbivores and pig. The parasitic diseases of these animals are at least as important as their bacterial diseases, and, with the conquest of distemper, promise soon to occupy first place. They are equally serious in foxes. Fortunately, medicinal treatment is available for many of these conditions—although by no means for all. We have a fairly detailed knowledge of the bionomics, life histories and methods of infection of practically all the important forms, and efficient means of prevention can be employed in many cases."

When we consider that the dog is able to carry all, and the cat at least one, of the following list of formidable parasites, and think of the intimate contact which these animals often have with human beings, one realises the efficiency of our methods for their control, by sanitation, meat inspection and anthelmintic treatment. The parasites are as follows: *Echinococcus granulosus, Tænia hydatigena* (= *T. marginata*), *Tænia cœnurus, Tænia ovis* and *Trichinella spiralis.*

Interesting notes are given on these and on many others in the course of the paper, including points which may be new to some readers on prenatal infestation with *Belascaris* and *Toxascaris,* and on the lungworms of carnivores —important contributions having been made by the author, at one time and another, to our knowledge of the life cycle of these worms.

The scope of the survey is restricted to the parasitic worms and protozoa of the greatest economic importance and most common occurrence in cats, dogs and foxes.

[A slight error should be corrected with reference to the distribution of *Spirocerca sanguinolenta,* which does occur in North America, having been reported (according to Price), from nine different states in the U.S.A.]

E. L. T.

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**[The Nutritive Value of Legume Husks.** Linton, R. G., Wilson, A. N., and Watson, S. J. (1934.) *J. Agric. Sci.* Vol. 24. Pt. 2.]

In this article the feeding values of pea, bean and lentil husks are compared.

As pea husks usually contain a variable amount of kernel their nutritive value is higher than in the case of bean husks, but they are both characterised by a low protein and high digestible fibre content. They are both rich in calcium and poor in phosphorus. Pea husks are useful fed in conjunction with linseed cake to sheep at lambing time, especially when mineral mixtures are not being given. Lentil husks are commonly used for feeding to dairy cattle, but as all samples examined contained a high percentage of kernel, the protein content was much higher than would have been the case if only the husk had been examined.

B. B-J.

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**[The Composition of "Witch's" Milk.** Linton, R. G. (1934.) *Vet. J.* Vol. 90. No. 5.]

The author records two foals which secreted "witch's" milk and compares the chemical composition with that of the mare.

In the first case half a pint was drawn from a two-day-old filly foal. The composition differed from that of the mare, being lower in total solids, protein, fat and sugar.

In the second case a sample was drawn from a four-day-old foal and it closely resembled that of the mare in composition although lower in protein and higher in fat. Another sample taken four days later contained a higher percentage of protein.

In both cases the analyses suggest that the mammary secretion was true milk.

B. B-J.

# N.V.M.A. Divisional Reports

## VETERINARY PRACTITIONERS' LEAGUE*

### FIRST ANNUAL GENERAL MEETING

### President's Address at Birmingham

The first Annual General Meeting of the Veterinary Practitioners' League was held at the Grand Hotel, Birmingham, on Thursday, July 19th, 1934, when there were present: Messrs. E. P. Edwards, H. W. Steele Bodger, C. W. Elam, J. W. Hall Masheter, J. Cane, H. W. Dawes, R. L. Phillips, O. V. Gunning, Paul Crosfield, H. B. Hiles, J. C. Coleman, C. W. Cartwright, C. F. Shawcross, Wm. F. Wilson, F. J. Eardley, C. J. Pugh, A. Mackenzie, Leonard S. Balls, F. J. Taylor, W. Hamilton Kirk, W. L. Dwerryhouse, L. Heelis, Sydney Jennings and the Hon. Secretary.

In the unavoidable absence of the President, Captain W. K. Townson, whose Address from the Chair was read in the course of the proceedings, Mr. Steele Bodger was elected to the chair. A unanimous vote of sympathy was passed with the President in his unfortunate illness—the effects of lightning stroke—and the Secretary was requested to convey to him the League's best wishes for a speedy recovery.

Apologies for non-attendance were received from the following: Captain W. K. Townson (President), Messrs. J. Kennedy, J. Campbell Hill, G. F. Banham, Clement Elphick, H. B. Kauntz, Major Stothert, Mr. Howel V. Hughes, Lieut.-Colonel Mulvey, Mr. Frank Christopher, Major Frank Chambers, Messrs. Horace L. Roberts, Brinley Sayer, T. Thomson, W. Paley, R. Langford, A. R. Smythe, James F. Taylor, J. L. Buckingham, G. E. Gibson and David Brown.

#### Hon. Secretary's Report

The Secretary reported that the membership on that day was 204.

*Resignations.*—Three resignations had been received, *viz.*, those of Mr. Caldwell (Bournemouth), and Messrs. T. and J. W. Knowles (Wisbech).

*Deaths.*—The death of Mr. James Lindsay, of Dumfries—a member of the Council of the League—was reported, and a vote of sympathy and condolence was passed in silence and the Secretary was requested to communicate with Mrs. Lindsay.

*League's Representatives on Council, N.V.M.A.*—The following names had been sent in reply to a request from the General Secretary: Messrs. Frank Chambers, Horace L. Roberts, H. W. Hall Masheter, R. F. Wall, O. V. Gunning, G. E. Gibson, sen., and the Hon. Secretary.

The Secretary further reported that the British Committee of the International Congress had sent a donation of £10 to help to defray the expenses of the League's representative—Captain Leonard S. Balls—at the International Congress at New York. A letter had been sent accepting this with thanks.

*General Meeting.*—To be held at Edinburgh during Conference week. The Secretary reported that Dr. Bradley had kindly placed a room at the disposal of the League, at the Royal (Dick) Veterinary College—if it were needed. It was generally thought that it would be advisable to hold such meeting.

#### Hon. Treasurer's Report

In his report the Hon. Treasurer stated that 43 subscriptions were outstanding. The balance-sheet was audited and signed by the Hon. Auditors, *viz.*, Messrs. Mackenzie and Thomson.

A cordial vote of thanks was passed to both the Treasurer and the Auditors.

*New Members.*—It was resolved that in future the names of all those who wished to join the League be printed on the agenda calling a Council or general meeting, and that such names be proposed and seconded at those meetings and put up for election there and then.

It was also resolved that all new members be asked to pay their subscription at once.

#### PRESIDENTIAL ADDRESS

In the unavoidable absence of Captain Townson, the Presidential Address was read by the acting Chairman, as follows:—

"You have done me a great honour, but you have also placed on my shoulders a great responsibility, in electing me to the office of President of the Veterinary Practitioners' League. I accept the office with much diffidence, for, as a member of Council both of the N.V.M.A. and of the R.C.V.S., my position will by some persons be thought to be equivocal. But as the League has been accepted as a Division of the National, and as I am convinced that the policy of the League will be in no respect inimical to the best interests of the profession as a whole, I have no reason to feel that in accepting the office I am doing anything incompatible with my membership of the two Councils mentioned.

"The League has been brought into being for the sole purpose of providing a distinctive body through which the views of the general practitioner can be expressed. The general practitioner, as is universally acknowledged, is the

* It should be noted that, at an Extraordinary General Meeting of this Division, an account of the proceedings at which concludes this series of reports, the title of this organisation was changed to "The Society of Veterinary Practitioners."

backbone of the profession. Numerically we outnumber all other sections of the profession put together. There can be no doubt whatsoever that if all the general practitioners become members of the League, we shall be a body whose opinions, when formulated after due debate, will deserve the most attentive consideration of the parent body. That, indeed, is our principal object—to make the general practitioner articulate. But as we want the opinions we express to carry weight not merely because *we* are numerous but because *they* are sound, we must be careful to take wide views and, if possible, long views. We must recognise that whole-time veterinary services have come to stay and will probably increase in extent. Our future is bound up with the development of whole-time veterinary services. The work of whole-time veterinary officers touches ours at many points. There must therefore be developed between us and them a *modus vivendi* which shall relieve us of some of the anxieties through which we have been passing in recent years. This can only be reached by a complete and sympathetic understanding on our part of the position of the whole-time officer. We must, I think we are all agreed, expect a great extension of the whole-time veterinary services, but I think we can claim, in the interests of public economy, that we private practitioners are an existing asset of the community of which full use should be made by the community before proceeding to the creation of an entirely new national veterinary service on a whole-time basis. Our duty cannot, however, be restricted to protests against the appointment of increasing numbers of whole-time officers. We must be in a position to produce convincing evidence in the shape of proposals for carrying out the necessary public health work which will be quite as efficient, and more economical, than any other that can be proposed. Such a programme cannot be carried out, however, by a few officials of the League. Each member of the League must be willing to co-operate by taking an increasing interest in the public health work of his district, and by communicating his criticisms or proposals in a concrete form for the consideration of the League or its Council.

"It has, I believe, been objected against the League that its creation was not necessary, since the Council of the N.V.M.A. would be able to do all the work which the League could possibly perform. I am sure that, on reflection, everyone will see that that objection is unsound. If it were a just objection to the creation of an association of general practitioners, the same reasoning would be just as cogent against the formation of veterinary officers' associations. There is undoubtedly need for an organisation which shall express the views of the general practitioner—whether he be at the same time a part-time veterinary officer or not. Indeed, I would go further. The greatest danger we general practitioners have to fear is that we become buried in our own very absorbing job, and become apathetic in regard to the larger matters of policy concerning the profession as a whole. I think that the creation of the League will stimulate more of us to come into the arena and join forces with the rest in the endeavour to improve the lot of the general practitioner. The League, by providing a common ground on which we can all meet as equals to ventilate our grievances and talk over our difficulties, and discuss our plans for improvements, ought to be of the greatest possible service to the N.V.M.A. 'In the multitude of counsel there is wisdom' is only another way of putting our professional motto, and in my view anything which will be an antidote to apathy is to be welcomed.

"We cannot, of course, expect great results all at once. We must be as patient as we can while the attempt is being made to formulate plans for safeguarding the work of the general practitioner without detriment to the public interest, and if, as I believe, we all agree that the public interest is bound to come first, then it is unlikely that our plans can be unacceptable to the N.V.M.A. We must secure the support of the Council of that body if we want our proposals to be carried out."

The Secretary was requested to write to Captain Townson a letter of thanks for, and appreciation of, his services.

## ELECTION OF OFFICERS

*President.*—Mr. Steele Bodger proposed and Mr. Coleman seconded the re-election of Captain Townson. This was carried unanimously.

*Vice-Presidents.*—Four were elected, *viz.*, Professor James McCunn, Major Mattinson, Mr. James F. Taylor and Mr. E. P. Edwards.

Mr. H. W. Dawes gave notice of motion that there should be four or more Vice-Presidents, as found necessary.

*Hon. Secretary.*—With regret, the Hon. Secretary tendered his resignation because he felt he could not do justice either to the League or himself if the duties were to be carried out in the way they should be.

He was thanked for his past services and Mr. Steele Bodger was unanimously elected to take his place. Under pressure and a keen sense of duty Mr. Steele Bodger promised to undertake the work for twelve months.

*Hon. Treasurer.*—Mr. Cane was unanimously re-elected.

*Hon. Auditors.*—Messrs. Mackenzie and Thomson were re-elected, and consented to act.

*Members of the Council.*—The following were elected (eleven in number): Messrs. T. Thomson,

C. W. Elam, R. L. Lewis, R. W. Hall, Clement Elphick, H. W. Dawes, R. F. Wall, Frank Chambers, Captain L. S. Balls and Mr. H. L. Llewelyn Jones.

*N.V.M.A. Council.*—The following proposal was negatived, after discussion: "That a combined body be formed of all those members of the N.V.M.A. Council who are members of the League, with a view to the adoption of a concerted policy at the meetings of the Council and Standing Committees."

*Annual Subscription.*—It was unanimously resolved to raise the annual subscription from 5s. to 10s.

*Report of the Committee of the Economic Advisory Council.*—This report was discussed and criticised by the following members: Messrs. H. W. Steele Bodger, E. P. Edwards, J. C. Coleman, H. W. Dawes and others.

The following resolution, proposed by Mr. E. P. Edwards and seconded by Mr. O. V. Gunning, was carried unanimously:—

> "That this Division is of the opinion that the recommendations contained in the report of the Committee on Cattle Diseases of the Economic Advisory Council to the effect that the future Veterinary Service for the administration of the various Public Health Acts and Orders shall be composed entirely of whole-time officers, is contrary to the best interests of Public Health, of the Agricultural Industry, and also of those of the Veterinary Profession as a whole.
>
> "The Division considers that the Council of the Association has received a mandate from an overwhelming majority of its members, and is itself pledged to oppose any State Veterinary Service which does not include the General Veterinary Practitioner as an essential part of such Service.
>
> "The Division therefore respectfully urges the Council to re-double its efforts to that end by every means in its power."

The meeting then terminated.

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## MEETINGS AT EDINBURGH

### General Meeting: N.V.M.A. President's Address

A meeting of the Veterinary Practitioners' League was held at the Royal (Dick) Veterinary College, Edinburgh, on Thursday, August 2nd, 1934.

*Chairman.*—On the motion of Mr. Campbell, seconded by Major Andrew Spreull, it was unanimously agreed that the President of the National Association, Mr. William Nairn, be asked to take the chair at the meeting.

The President, N.V.M.A.: I did not think at ten o'clock this morning that I would have any gatherings at all to address to-day. I thought I would be free and would have a holiday until to-morrow, at my final meeting, but I am delighted to have this opportunity of addressing a Division of the National, because as one who has had a year's experience of the business of the National one cannot but be interested in its various Divisions. Before I proceed further, I think we ought to express our regret at the illness of your President, Mr. Townson. We all deplore the reason of his absence to-day, and I am sure that it will be your wish that we should send him a message of sympathy and our best wishes for his early recovery. (Applause.)

I do not wish to take up your time by any irrelevant remarks. Much criticism has been levelled against the various outside bodies that seem to be springing up. We cannot, of course, regard your League as an outside body, because you are now incorporated as a Division of the National and, as such, are amenable to the discipline of that body, to a certain extent. In regard to my address (Presidential) yesterday, I have heard a certain amount of criticism, and possibly more has been said than I have heard. It has been criticised for my reference to "secret societies," I think somebody said. I cannot give you the exact wording now, but what I had in mind were bodies that were even within the National discussing questions of importance to the profession and to the National and not publishing any record of their transactions. While it might not make any difference to the results achieved by the National, it would certainly give more confidence to the N.V.M.A. if a record of the business transacted was published in our Association journal. I can see no objection to a Division that is anxious to devote its main energies to the promotion of its own interests, so long as that work is done with a due regard to the interest of other parties, but if an intolerant attitude towards the interest of other parties were to be adopted by a Division, as a definite policy, that would undoubtedly tend to break up the unity of the National itself, and, above all, I think the whole profession must recognise that the maintenance of the unity of the National is the biggest thing to seek for. (Applause.)

The National—and I say this from experience—is gaining considerable influence in various ways. It is difficult to show you, even from one year's work, exactly all that has been achieved. We cannot parade everything we do, because a great many of the negotiations cannot be disclosed at the time, but during the latter part of my year of office we have had occasion to visit various Government Departments, pressing the views of our members, and we always endeavoured to keep a balanced view of the interests of the various sections of our profession when we did so. (Hear, hear.) One

has to appreciate, after all, that the successful life recognises that there must be a compromise between the ideal at which one aims and what is possible. You can never get all you like in this life, and you have usually to accept a good deal less. When we go before the bodies that I have referred to, we have to recognise that. Recently, in a discussion with a Government Department, a scheme was put in front of me which I recognised was not altogether satisfactory to practitioners. I was asked my opinion, and I stated it, but I added that I recognised that the man promoting the scheme was doing the best that circumstances would allow him to do, and we had to accept it as such. It was better to co-operate with a thing that was barely what we would like than to oppose, uselessly, a thing which must come and which, in the end, would probably bring advantage to our profession. I would merely say that this League, although promoted principally for sectional interests, would do well to recognise when they elect representatives to other bodies, that they should make every effort to see that these representatives are sufficiently broad-minded for the purpose, so that they will promote a regard and respect for this Division as being a body of reasonable and reasoning mortals. If intolerant individuals are sent forward as the representatives of this body, the spirit of intolerance will undoubtedly detract from the value of their position. I think I have said all that I need say on that question, and I will allow the meeting to carry on with the business.

Mr. Steele Bodger: I am sure we are all very indebted to the President of the National for his remarks to us this afternoon—(hear, hear)—all the more so because we know him to be the absolute personification of honesty. (Applause.) He has had great experience during the last twelve months of the highest office which we in the National can offer to him. It was not necessary that he should have tolerance, but I am glad he has exercised tolerance, because I think that should be the guiding principle of this League. We do not want a Ku Klux Klan. We do not want any Communism. We do not want any extreme Left Wing. What we do want is a body to investigate matters that concern us as these come along, and support for our legitimate rights, and to take these matters to our parent body, the National, for their judgment upon our views and, if they agree with us, all the strenuous action they can take in the matter. Despite what has been said to the contrary, we are a Division of the National, and I am sure that no one would deplore any departure from these lines more than our President, who has addressed us this afternoon. He has performed for me a task which I personally was dreading, because he has expressed much more ably than I could ever do the views which I hold, that if we want to do anything, we must do it by persuasion and tolerance instead of by intolerant or extreme measures—and I am sure we are indebted to him for addressing us this afternoon.

Continuing, Mr. Steele Bodger explained that the minutes of the last meeting had not been published in the *Record* because of pressure of business on Mr. Llewelyn Jones. He thought it would be advisable that the minutes should now be read: this, accordingly, he proceeded to do.

*Correspondence.*—Mr. Steele Bodger read to the meeting a letter from the League President, Mr. Townson, regretting that, acting on medical advice, he could not accept the Presidency of the League for a second year. He also read a letter from Mr. Edwards, regretting his inability to attend, owing to indisposition. A letter was read from Mr. Paterson, of Shepton Mallet, explaining his inability to attend and asking that the following point should be considered by the meeting, *viz.*: "If milk grading or inspection of herds is to be done by full-time inspectors, what compensation is to be given to veterinary practitioners who are at present doing one or both?" There were apologies for absence from a number of members.

## ELECTION OF PRESIDENT

Captain O. V. Gunning, of Tutbury, was unanimously elected President of the League in the place of Captain W. Townson, and Mr. Nairn thereupon invited him to occupy the chair, which he vacated.

Mr. Steele Bodger proposed Mr. P. T. Lindsay, of Woolton, as a member of the Council in place of Captain Gunning. The proposal was seconded and unanimously agreed to.

On the motion of Mr. Campbell, seconded by Major Spreull, Major Hamilton Kirk was unanimously elected a member of Council in place of Mr. Steele Bodger.

*New Members.*—The following gentlemen submitted their names for election as members: Messrs. E. F. Angler, Doncaster; P. T. Lindsay, Woolton, Liverpool; Sir Frederick T. G. Hobday, Royal Veterinary College, London; Messrs. W. L. Gascoyne, Lutterworth, Leicester; J. P. Walker, Pencatland, East Lothian; Andrew H. Stark, Wishaw, Lanarkshire; A. M. Larnach, Musselburgh, Midlothian; J. B. Russell, Elgin, Morayshire; B. Philp, Cupar, Fife; S. E. Hill, East Rudham, King's Lynn, Norfolk; James Andrew, 154, Greenock Road, Paisley; A. P. Hamilton, Dunfermline, Fife; E. G. Langford, Epsom, Surrey; W. L. Dwerryhouse, Tamworth; J. A. Morris, Hounslow, Middlesex; A. H. Watson, Bradford, Yorks.; T. N. Gold, Redditch, Worcs.; W. P. Blount, St. Leonard's-on-Sea; W. W. Lang, Brigg, Lincs.; G. R.

Jamieson, Haddington; A. Pottie, Paisley; Malcolm McColl, Oban; J. H. McGhee, Chester; H. M. Wilson, Cupar, Fife; R. Swaby, Gainsborough, Lincs.; E. C. Bovett, Clifton, Bristol; W. Anderson, Pittenweem, Fife; A. H. Andrew, Ware, Herts., and R. E. C. Bullen, Godalming.

On the motion of Major Hamilton Kirk, seconded by Mr. James F. Taylor, the applicants were nominated and duly elected members, unanimously.

### Notice of Motion

Notice of motion was given by Major Hamilton Kirk that the word "League" in the title of the Division should be changed to "Society," and that the title should be "The Veterinary Practitioners' Society," or, "The Society of Veterinary Practitioners." After considerable discussion it was decided to refer the motion to an Extraordinary General Meeting.

*Constitution.*—The Chairman: "I will now call upon our Secretary to read the Constitution of the League."

Mr. Steele Bodger complied.

### Any Other Business

The Chairman: "Under this heading, the first point we have to discuss is the policy of the League. We have been very fortunate this afternoon in having Mr. Nairn, the President of the National Association, come here and address us, and he has perhaps said all there is to say on that point, in a broad way, and I think we might pass over that item, as time is getting on—unless any member has anything to say on the point."

Major Hamilton Kirk: "I think there is only one thing which the meeting should bear in mind, and that is that we must be very tolerant, as the President says. We must be constitutional."

Mr. Steele Bodger intimated that a shorthand report of the proceedings was being taken and that Mr. Nairn's remarks, together with a report of the meeting, would be published in the *Record*; he thought, therefore, that it would be appropriate that they should make it known that they were in entire agreement with the remarks of the President of the National Association. (Applause.)

The Chairman: "Talking with people here, it does seem that there is a lot of misapprehension as to the objects of the society, and I think the best we can do is to indicate, by personal contact, what our real objects are. I think that will do more than anything else to get us well established."

*Clerical Assistance.*—It was moved by Professor McCunn, seconded by Major Hamilton Kirk, that Mr. Steele Bodger have clerical assistance and that the question of meeting the expense of such assistance should be left to the discretion of the Treasurer and Secretary. This motion was unanimously carried, the meeting also agreeing, at Mr. Steele Bodger's request, that the President should have a share in these discretionary powers of administration.

*The Report of the Cattle Diseases Committee of the Economic Advisory Council.*—At the request of the Chairman, the Hon. Secretary made a lengthy statement on the above.

In concluding the meeting, the Chairman expressed the members' appreciation of Professor McCunn's presence and support, and also voiced their appreciation of the presence and support of the Scottish members. He thought it was a very good omen for the success of the Veterinary Practitioners' Society, and he hoped it would be a memorable meeting and that all the members present would put their whole heart into the work and would help the Hon. Secretary to make the society a real success. (Loud applause.)

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## Extraordinary General Meeting

### CHANGE OF TITLE

An Extraordinary General Meeting of the Veterinary Practitioners' League was held in the Royal (Dick) Veterinary College, Edinburgh, on Thursday, August 2nd, 1934, with Captain O. V. Gunning, President, in the chair.

The Secretary said that the item on the agenda for that meeting was the change of title. Notice of motion had been given that it was desirable to change the title of the League to "The Society of Veterinary Practitioners."

Major Hamilton Kirk proposed accordingly and Professor J. McCunn seconded.

The President: "The resolution that we change the title is moved and seconded and approved, and the resolution goes to the National Association. That concludes the business of the meeting."

On the motion of Mr. Steele Bodger, the President was accorded a hearty vote of thanks for his conduct in the chair.

H. W. Steele Bodger, *Hon. Secretary.*

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# VETERINARY MEDICAL ASSOCIATION OF IRELAND

## Annual Provincial General Meeting

The Annual Provincial General Meeting of the Veterinary Medical Association of Ireland was held in Limerick on Saturday, July 28th, 1934.

The meeting was in two parts, *viz.*:

1. Practical Demonstration of the production of clean milk, at three dairy farms outside the City, by Mr. Patrick Harnett, M.R.C.V.S., at 5 p.m.

2.—(*a*) Paper on "Milk Hygiene," also by Mr. Harnett;

(*b*) Discussion regarding the Terms and Conditions of Appointment of Veterinary Officers under the Inspection of Dairies and Cowsheds Order, at the Town Hall, Limerick, at 8 p.m.

The following Members of the Profession were present:—

Messrs. E. A. Phipps, E. J. Phair, J. J. Dundon, J. A. Kelly, T. R. Hunt, P. J. Gaffney, F. A. Heney, J. Lynch, Wm. Nyhan, S. Conway, J. A. McMenamin, T. Kelleher, M. G. Hynes, R. J. Nolan, T. Fitzpatrick, M. J. Ryan (Abbeyleix), R. R. Pierse, W. B. Prendergast, M. O'Sullivan, S. Hyde, P. McDonnell, A. E. Brandon, T. R. Mulcahy, J. F. O'Grady, P. Carroll, M. J. Glynn, Wm. O'Callaghan, H. Dolan, T. F. C. Hogan, R. P. Byrne, J. D. O'Connor, C. P. Hynes, J. J. Condon, M. J. O'Meara, R. J. Murnane, W. Walsh, J. J. Walsh, F. Crowne, W. J. O'Donoghue, A. J. MacDonald, Miss H. Bisset and Professor J. J. O'Connor.

*Chairman.*—On the motion of Mr. Dundon, Mr. C. P. Hynes, Lismore, was elected to the Chair.

*Minutes.*—The Chairman announced that the minutes of the previous meeting had been circulated and on the motion of Professor O'Connor, seconded by Mr. Dundon, they were taken as read, and signed.

*Correspondence.*—Correspondence included communications from Professor Craig, Professor Kearney, Professor Browne and Messrs. P. F. Dolan, T. I. Alexander, S. O'Donovan, A. A. Donnelly and J. Daly apologising for their absence from the meeting and wishing it every success. Mr. Alexander said there was very important business on the agenda in connection with the "bread and butter" side of the Profession, and he trusted that the Association would keep pegging away "about our microscopic salaries," and that his Association would give every assistance in the matter.

Mr. Donnelly in the course of his letter, which was dated July 27th, 1934, said that he greatly regretted not being able to get to Limerick for the meeting. The subject for the paper, "Milk Hygiene," was especially suitable at the moment. It was one that fully interested the general practitioner, the part-time officer and most whole-time officers. It was for our profession to show that we were *au fait* in all matters relating to milk production, that we were keeping fully abreast of the times and that we were the persons to advise and to be consulted as regards our (the most important) end of the business. Speaking of the forthcoming "Clean Milk Bill," it might be of interest to learn at the meeting if the promoters of the Bill consulted the Veterinary Profession when drafting it. We had men in the Profession, such as Mr. Dolan, Mr. Harnett (the writer of the paper), Mr. Dundon and Mr. Cussen—to mention only a few—who had made a special study of milk. Had a single one of those gentlemen or any veterinary surgeon been asked to give his valuable, sound and expert advice in connection with the Bill? If not, why not?

The Chairman said that was a very important letter and that the points mentioned therein deserved careful consideration.

Mr. Daly, in his letter, expressed deep regret that owing to absence on holiday it would not be possible for him to attend the meeting. It was one he particularly desired to attend, as it was a provincial meeting, and also because he would have liked to have heard the paper read by Mr. Harnett, M.R.C.V.S., on milk and the discussion on it, as the matter was of special interest at the moment.

*Paper.*—The Chairman now called upon Mr. P. Harnett, M.R.C.V.S., of the Limerick Veterinary Department, to read his paper on "Milk Hygiene."

At the conclusion of the paper Mr. Harnett received prolonged applause. It dealt exhaustively and lucidly with the subject and its interest was enhanced by the eloquent way in which it was delivered.

[Mr. Harnett's paper and a report of the discussion upon it will be found at the commencement of this issue.—Ed. *V.R.*]

J. J. O'Connor, *Hon. Secretary.*

## LIVER-ROT AND THE DROUGHT

As a result of the prolonged drought the breeding places of the small water snail that is responsible for the early development of the liver fluke have been considerably reduced; large areas of wet land have become dried, and only small wet patches and restricted pools have been left behind. A splendid opportunity is thus afforded (says the *Journal of the Ministry of Agriculture*), for taking a decisive step towards the eradication of the liver fluke from the farm. The few remaining haunts of the snail (centres of infection for the liver fluke) should be dressed with a mixture of finely-powdered bluestone and dry sand, in the proportions of 1 to 4, and at the rate of 1¼ to 2¼ cwt. to the acre. Great benefit will result from this treatment, which may be repeated with advantage after an interval of three weeks. It is, however, a wise precaution to keep sheep and cattle away from the treated ground until after rain has fallen.

As a further step towards the eradication of the parasite from the farm the treatment of all adult sheep with carbon tetrachloride, or alternatively, extract of male fern, is also recommended at the present time. This applies to every member of the flock and not only to sheep that appear to be thriving badly. As a result of the dry season it is unlikely that the sheep are now carrying anything but mature flukes, and treatment may be expected to expel all that they are carrying without leaving behind a residue of immature flukes, as usually happens when treatment is carried out at other times. Farmers are warned, however, that care must be observed in the use of carbon tetrachloride because of the poisoning that occasionally results.

# Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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## DIARY OF EVENTS

Oct. 8th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

Oct. 9th.—Meeting of the North Midland Division, N.V.M.A., at Sheffield.

Oct. 10th.—Meeting of the Lincolnshire and District V.M.A., at Lincoln.

Oct. 12th.—Meeting of the Eastern Counties Division, N.V.M.A., at Bury St. Edmunds.

Oct. 18th.—Meeting of the Western Counties Division, N.V.M.A., at Taunton.

Oct. 19th.—Joint Meeting of the Mid-West and South Wales Divisions, N.V.M.A., at Cardiff.

Nov. 2nd.—Annual General Meeting and Re-Union Dinner, R.A.V.C. Old Comrades' Association, Anderton's Hotel, Fleet Street, E.C.

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### PERSONAL

*Mr. W. Jackson Young's Appointment.*—Mr. W. Jackson Young, F.R.C.V.S., D.V.S.M., who for the past 9½ years has acted as the Ministry of Agriculture's representative for the Northern counties, has been promoted superintendent inspector for the whole of Scotland, and will be resident in Edinburgh. At a recent meeting of the North of England Division, N.V.M.A., his colleagues paid tribute to his services to the profession generally, and honoured him by electing him an honorary member of the Association. Mr. Young is a familiar figure amongst agriculturists in the North, especially flockmasters and shepherds, and his lectures on sheep lore are the subject of much interest and discussion throughout the hills and dales.

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*Will.*—Lindsay, Mr. James, M.R.C.V.S., of Dumfries (personal estate), £9,932.

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### R.C.V.S. OBITUARY

Knight, Robert, Abbot's House, Dunfermline, graduated N. Edinburgh, April 24th, 1878; died September 22nd, 1934, aged 80 years.

Marshall, William. Craigwillie, Huntly, Aberdeenshire. Graduated Glasgow, December 23rd, 1891; died September 25th, 1934, aged 64 years.

Scott, Richard. Wolmer View, Whitehill, Bordon, Hants. Graduated New Edinburgh, December 19th, 1901; died October 1st, 1934, aged 58 years.

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### The Late Mr. Robert Knight, M.R C.V.S.

Mr. Robert Knight, whose death occurred after a protracted illness, has been veterinary inspector to the burgh of Dunfermline since 1900, when he succeeded his father in the post.

A native of Alloa, Mr. Knight was educated at the local academy, and later took his degree at the Royal Dick Veterinary College, Edinburgh, where he was a prizeman and medallist. He was well-known in Fife agricultural circles, and his services were in great demand as a judge of the horse classes at the various agricultural shows held in the county. Mr. Knight was a horseman of note, and for many years was a familiar figure at the Fife point-to-point meetings and at farmers' race meetings in West Fife. Mr. Knight was also associated for a long period with the old Fife Light Horse. He achieved fame as a breeder of hunting horses and Clydesdales, and latterly he took up the breeding of Cairn terriers.

Mr. Knight resided in the Old Abbot's House, Maygate, Dunfermline, a familiar landmark to tourists to the town. He is survived by Mrs. Knight and a brother, Mr. John Knight, who is resident in California.

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### CHEAPER MILK IN SCHOOLS

The scheme for cheapening the supply of milk to school children, devised by a Committee of the Milk Marketing Board in pursuance of the provisions of the Milk Act, which was passed this year, came into operation this week. Henceforward the price of milk will be reduced from 1d. to ½d. for a third of a pint to those children whose parents desire them to consume it. In a circular issued to local education authorities the Ministry of Education express the hope, however, that these authorities will be prepared, in appropriate cases, to provide milk free for children who need it and are unable to pay for it.

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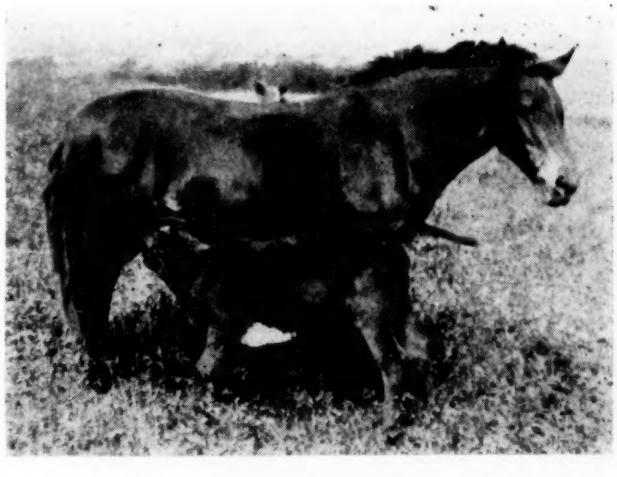
### MARE SUCKLING CALVES



For the above photograph we are indebted to Mr. John Kernohan, M.R.C.V.S., of Ballymena, who sends us the following note:—

"The accompanying photograph, taken by the Editor of the *Ballymena Weekly Telegraph*, illustrates an observation made by me on the farm of one of my clients such as has not been repeated elsewhere, within my knowledge. This gentleman informed me that he had a mare suckling two young calves, and he took me to a field where eight calves were grazing with a mare nine-years-old, about 15·1 hands high. The

evening drink was brought for the calves, and a red calf, as soon as it had finished, came right over to the mare, and commenced suckling her, to be followed in a minute by a roan. Both drew from the mare at the same time, and I regret that the photograph (taken later) shows only one calf.

"A further remarkable feature is that—as I am assured by the owner—this mare has never had a foal, nor been served, yet she has plenty of milk."

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## FULL-TIME VETERINARY OFFICER FOR MONTGOMERYSHIRE

At a recent meeting of the Montgomery County Council, the County Veterinary Sub-Committee, under the chairmanship of Major Dugdale, recommended that the Council be asked to approve the appointment of a full-time veterinary officer, and that the sub-committee be authorised to arrange the details in the county. The cost of such an appointment was estimated at £850.

Major Dugdale, moving the adoption of the report, said that the committee asked for power to go forward with the details because something would have to be done two months prior to launching the Marketing Board's scheme to enable producers to take full advantage of it. The surgeon's salary was estimated at £600 a year and travelling expenses at £250. The Committee had had a long discussion but had eventually unanimously agreed to the recommendations now presented. If the Council waited for the Marketing Board's scheme there would be a shortage of veterinary surgeons and they would have considerable difficulty in securing a suitable man.

In reply to Mr. T. E. Kinsey, the chairman said that there was no information available with regard to the possibility of a Government grant.

Mr. W. A. Tutton said there was always a lot of controversy when the subject of a veterinary surgeon cropped up. They could not separate the appointment from the question of public health. If it had been necessary in the past to appoint a Medical Officer of Health it was absolutely essential to appoint a veterinary surgeon to see that cows were free from tuberculosis.

Mr. G. F. Hamer said the question of cost should be neither here nor there. It was a question of health and their duty was to the consumers and not to the producers.

The chairman observed that it was most important to a county like Montgomeryshire, depending to a large extent on agriculture on the milk side, that they should take every possible step to give the public confidence in the milk and that they should not be behind other counties in that matter.

The report was adopted.

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A whole-time veterinary officer is to be appointed by Tynwald, for the Isle of Man.

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## SHIRE HORSE SOCIETY

At a recently-held meeting of the Council of the Shire Horse Society, satisfaction was expressed at the improvement which had manifested itself in all branches of the Society's activities during the current year. Finances, membership, Stud Book and Show had all reflected an upward tendency.

Mr. A. Thomas Loyd (Chairman) also reported that satisfactory arrangements had now been concluded whereby the London Show would be held a month earlier than usual in the years 1935, 1936 and 1937. In 1935, the actual dates would be Tuesday, January 29th, Wednesday, January 30th and Thursday, January 31st, and it was felt that this alteration would result in a further increase in the number of horses tendered for exhibition. It would certainly be helpful to the brood mares, while it would not be so close to the commencement of the travelling season for stallions, with the result that hiring Societies would have better facilities for selecting their stallions.

The schedule of prizes was approved as last year, except that a new class was introduced for two-year-old geldings with prizes of £15, £10, £7 and £3, bringing the total offer up to £1,800. The Council accepted with grateful thanks Mr. G. R. C. Foster's offer of one hundred guineas with which to provide a new cup for the best stallion, the previous cup and the 14th of the series having been won by Mr. Foster's "Bower Winalot."

In the twenty-two breeding and commercial classes the adjudication of prizes would be in the hands of Mr. Thomas Fowler, Captain A. H. Clark and Mr. Milton Harris, with Messrs. Robert Stuart, E. J. Holland and T. M. Watson in reserve. Major-General Sir John Moore would again undertake the award of the special appointment prizes in the commercial section. Among other appointments made was that of Mr. T. Eaton Jones, F.R.C.V.S., as Chief Veterinary Officer.

It was reported that in addition to the £500 allocated to the 1934 Royal Show at Ipswich, Gold, Silver and Bronze Medals and Breeders Prizes had so far been awarded at about 150 other shows during the year, involving an outlay of approximately £1,000. Arrangements for the 1935 Royal Show at Newcastle-on-Tyne would be made at the next meeting of the Council, but in the meantime the whole of the offer of medals, etc., was renewed to affiliated shows.

The number of stallions accepted for registration again showed an increase over the previous year, and in view of the change of date of the Show endeavours would be made to publish Volume 56 correspondingly earlier.

Seventy-four new members were elected.

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A new sheep dipping bath and compound—the first of their kind in Britain—were brought into use in the Hope Valley, Derbyshire recently. Octagonal in shape, the bath has a capacity of about 400 gallons.

Important new features are:—

Cement catching pens, and the provision of two gates which will automatically close behind the sheep;

Dripping pens with sides of light metal to catch the dip and prevent wastage;

A roller which will automatically plunge the sheep into the bath, preventing any unnecessary handling of the animals; and the construction of the bath on the same level as the catching pens, so that the sheep need not be handled when in the bath.